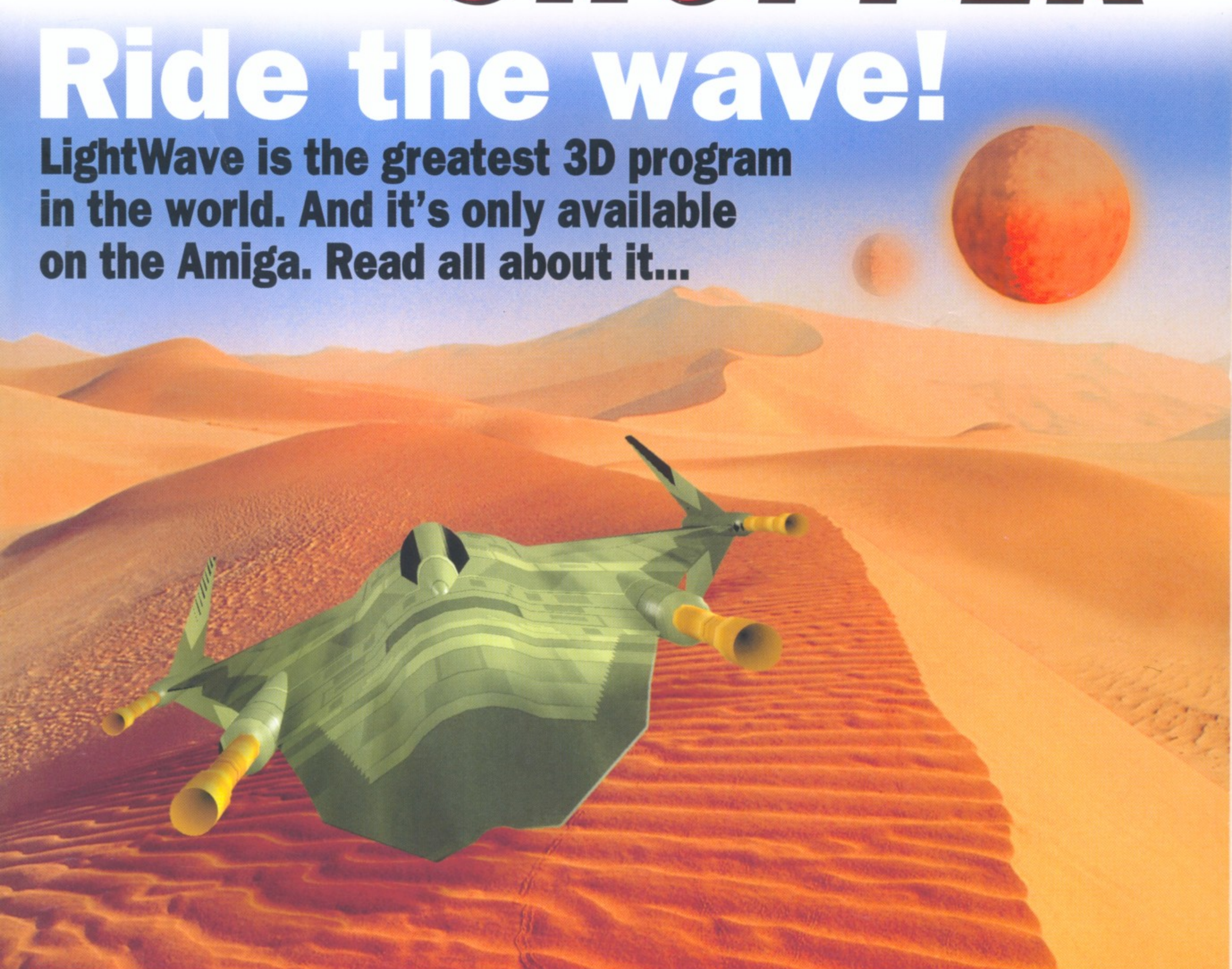
The magazine for hardcore Amiga enthusiasts!

SHOP AND SAVE - turn to page 41

AMIGA SHOPPER

From the makers of AMIGA FORMAT



Ride the wave!

LightWave is the greatest 3D program in the world. And it's only available on the Amiga. Read all about it...

ISSUE 43 ● NOVEMBER 1994 ● £2.50

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IN THIS ISSUE

AMIGA SHOPPER NOVEMBER 1994 No 43

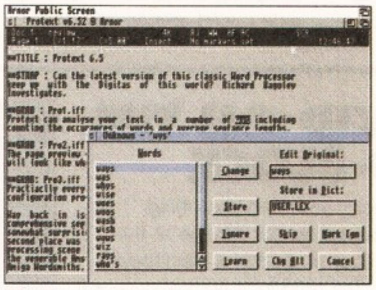


Welcome to Amiga Shopper! This magazine is dedicated to giving you, the serious Amiga user, the best. This month, we have a full review of one of the most exciting pieces of software that we have ever seen: LightWave.

Unlike other magazines, we have really taken the program apart, and we haven't been blinded by the hype. We tell it to you straight. If you want the real truth about a product, you know where to come...

Richard Baguley
Editor





Can Protext 6.5 keep up with the Final Writers of this world? Wordsmith extraordinaire Richard Baguley investigates on page 24

You can save yourself hundreds of pounds with our exclusive reader offers!
See page 41 for details.

FEATURES

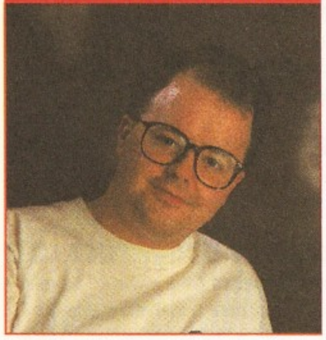
REVIEWS

TUTORIALS

REGULARS

AMIGA SHOPPER
Everything you'll ever need to get the best out of your Amiga

COMMENT



Richard B ponders over this month's Amiga events...

Working for a magazine can be a frustrating business. For instance, we were hoping to have some good news on Commodore for this issue, but at the time of going to press there was still no firm news from Commodore. Time and magazine printers wait for no man, so we have brought you the latest on what is going on. At the moment, Commodore are still in the curious limbo where nothing is decided.

"No news is good news" some wit once commented. They obviously hadn't been involved in any management buy-outs. The indecision and legal wrangling benefits no one and hurts the Amiga. Every day that no Amigas are available hurts the cause, with more people buying PCs and more companies either holding back on products or deciding not to release them at all.

Hopefully, things will change shortly. David Pleasance has talked about his plans for the company, and these sound extremely interesting, including improved support for developers. Will the new and improved Commodore put the Amiga back up where it belongs? Only the gods (or goddesses) know...

IT'S DO OR DIE TIME FOR COMMODORE

No news from Commodore UK on MBO, Philippines plant closed and AAA abandoned.

Christmas is fast approaching and most retailers are preparing to fill their pockets with the increased revenue that this time of year brings. However, whether or not any of the profits will be generated from sales of the Amiga is in serious doubt.

The deadline for a decision on the future of Commodore has passed and yet (at the time of going to press) no announcement has been made. In short, time is running out. Stocks are running extremely low and there will simply not be enough Amigas to meet the Christmas demand unless a functional Commodore emerges very soon, and there are serious doubts within the industry as to the ability of any new company to manufacture large quantities of Amigas before Christmas.



David Pleasance has just made a trip to the US. Let's hope good news is in store for us.

But what will happen if Commodore don't have any machines ready in time for Christmas? One thing is certain, existing Amiga-owners won't wake on Christmas morning to find that their machines have disappeared. We will still have our machines and most of us will still be eagerly waiting for news of Commodore's future.

At the time of going to press, there were still two bidders for the remains of Commodore International – the Commodore UK management buy-out offer and an offer from CEI of Florida. The heads of both companies are confident that their offers will be accepted, although most industry pundits put the Commodore UK offer in the lead.

Unfortunately, matters are not helped by the recent seizure of a Commodore production plant in the Philippines, by the Philippino Government and other creditors, as they are still owed money for rent and other bills on this factory. Apparently, Commodore have been counting on the component parts to be handed over by the liquidators once the deal had been completed. David Pleasance has been reported saying that these expected supplies were to play an important part in the production of products for Christmas. Although Pleasance was bullish about the possibilities of restarting production in the UK, there is still no guarantee that this would be in time for supplies to reach the shops for Christmas.

He also revealed that although the AAA chipset is almost completed, this project has been closed. Although the chips themselves are nearly complete, it would take another 18 months to complete the work required for the operating system to work with these chips. Instead, according to Pleasance, the R & D department will now be concentrating its efforts on developing RISC-based technology for the next generation of Amigas, although no firm dates have been set for this or the launch of any new machines. Lew Eggebrecht (Ex-Vice President of Engineering at Commodore International) has also parted company with Commodore.

David Pleasance was in the US when we tried to contact him, and nobody else from Commodore UK was willing to comment on the progress of the management buy-out, apart from "there is no news at present".

Meanwhile, the liquidators have been busy selling off the remains of Commodore International. A series of auctions were held in Commodore's old base of West Chester, and all of the office and test equipment were sold off. Several development models of Amiga were also sold, including some of the early A4000s used in the protyping of the machine. One source estimated that this sale raised around $500,000.

Free CD for 3D Artists

Syndesis are still looking for good 3D objects to include on their second 3D-ROM. They are asking 3D artists to send in examples of their work to be included on the disc. The first 3D-ROM, reviewed in issue 39, contains over 580 3D objects in several file formats and a whole load of texture images. It normally costs $199, but if any of your objects are included on the second disk you will be supplied with a free copy.

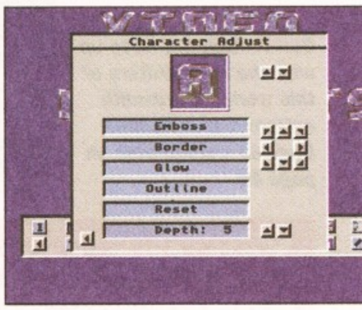
They have just released the latest version of *Interchange Plus*. *Interchange Plus 3.0* costs $199 and can translate between a wide number of 3D objects. As standard the program supports the following file formats: LightWave, Imagine, Sculpt, 3D Studio, DXF and even Vista DEM files.

Other file formats are also supported by means of add-on converters which are available separately. The other formats supported include, Softimage, Alias StyleGuide, Vertigo and Crystal Topas. Version 3.0 also includes the InterFont Converter and 75 ready-made fonts. The program converts outline fonts into 3D objects. After selecting the font, entering your text and specifying your desired extrusion depth, the program will produce a 3D object in any of the supported file formats.

You can contact Syndesis Corporation by calling them on ☎ 0101 414 674 5200.

NEW KID ON THE VIDEO-BLOCK

Pizaz is a new entry into the video-titling battlefield. It's scheduled for release at the beginning of October at a special introductory price of £49.99. The product's normal price will be £59.99 and can be purchased directly from Video FX – the product's creators.



Pizaz is a new entry into the video-titling battlefield.

According to the manufacturers, Pizaz's main claim to fame is its object-orientated design. Apparently, the program has extensive scrolling functions and animation facilities as a result of this approach. The program has a scripting board, that has several automatic special effects – these include expansion, folding and rotation of characters. Characters can be scrolled in a variety of ways, such as words, lines or pages and can be moved at user-defined speeds.

The product sounds quite interesting and you can expect a review quite soon. However, if you just can't wait, you can buy a demo copy of the program for £10. Call Video FX on ☎ 0443 674385 for more information on this new product.

SILICA SLASH SCALA PRICES

Silica are now selling a new Scala Software Suite that comprises *Scala MM300* and *Scala Echo*. The bundle is being sold for a price of £399, which is a saving of £79 on the individual prices of the two products.

Scala MM300 is one of the best multimedia and video-titling programs available for the Amiga (We gave it a very healthy 9 out of 10 in our review in issue 37). Silica hope the combination of this popular program and the *Echo* unit will prove to be a powerful desktop video solution.

Scala Echo is a cable unit that, when connected to the Amiga's serial port, can be used to control a VCR through an infrared sensor.

Echo comes supplied with software modules that control recording and playback functions by learning from the existing remote control unit. It also comes with a clip-art library and infrared trainer software that can be used to "train" the infrared unit to control the VCR.

If you would like to get hold this money-saving bundle, or just find out more, call Silica on ☎ 018 309 1111.

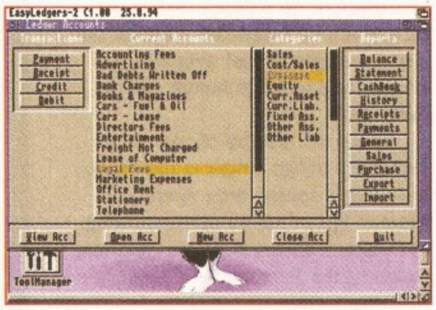
Accounting help from Down-under

Australia-based, Small-Biz Pty Ltd have just finished work on Easy Ledgers 2. It's an accounting package that's aimed at a broad range of Amiga-users, from people trying to stay on top of their personal finances to small businesses.

We've taken a look at a demo version of this latest release and it does look very promising. It appears to be one of the most polished and well-designed products of its kind. It requires 2Mb of memory, a hard disk and Workbench 2 or later.

The program is divided into five account types: Purchase, Sales, Ledger, Inventory and Jobs. Adding an account or making a transaction is simply a matter of clicking on a button or double-clicking in a field. You can expect a review of this product in a couple of issues time.

Although no price has been set so far, you can find out more by calling Small-Biz on ☎ +61 074 91 9190.



Easy Ledgers 2 is an accounting package that is aimed at making the financial life easier for a broad range of Amiga-users.

COMPUTER PORNOGRAPHY WHITE PAPER

The ELSPA (European Software Industry Association) are asking the Government for more police resources to help fight the illegal publication of obscene software. To this end the body, which includes several large software houses, has launched a White Paper into Computer Pornography in the UK.

The paper outlines the current legal framework in the UK and highlights the growing black market for this kind of software. It also provides some helpful guidelines for parents who want to keep their children away from this type of pornography.

ELSPA can be contacted by phone on ☎ 0386 830642 or by writing to Station Road, Offenham, Near Evesham, Worcs WR11 5LW.

STYLUS PRO-PACK

Stylus Inc, the makers of the *ProVector* structured drawing program, have announced a software bundle, aimed at the professional artist, called the *Stylus Pro-Pack*. The pack will include a copy of version 3 of *ProVector*, an updated version of *StylusTracer*, *PSImport* and *RexxRequest*. The *Pro-Pack* will cost $299.95 at full price, but will be available direct from *Stylus* for an introductory price of £199.95.

Registered users of *ProVector 2.1* can upgrade for $129.95. The company is also offering a competitive upgrade of $149.95 for users of *Art Expression*, *Design Works*, *Aegis Draw* and *Professional Draw*. All these offers are open until the this year.

Version 3 of *ProVector* sounds as if it has really been beefed up. It has apparently undergone an "interface-lift" and now takes advantage of the AGA chip-set. It has new gradient fill features and clipping paths. It can now output 24-bit anti-aliased ILBM files. It also takes advantage of Workbench 2 and 3's new features to provide on-line help. The program can save files in the Macintosh's popular *Adobe Illustrator* format.

PSimport has also got some new features. It's a program that can load and edit PostScript files. StylusTracer can be used to convert bitmap images to vector ones. It's also got some new features such as image-processing and touch-up tools.

Contact Stylus Inc. on ☎ 0101 303 484 7321.

Making Music with Bertie Bunny

Making Music With Bertie Bunny is a new educational program that aims to make learning fun for all children from the age of 2 upward.

The program introduces children to a number of different instruments and lets them hear how different combinations of instruments will sound. The child can control the instruments by using the Amiga's keyboard.

It costs £24.99 and is available from WindShadow Software on ☎ 0101 905 836 4400.

PROTEXT PRICE-FALL

Just after our review of *Protext 6.5* (see page 24) left for the printers, Arnor made some price cuts on the range.

Protext 6.5 has been reduced to £74.95. Upgrades from earlier versions are also available and cost, £29.95 from 6.0, £39.95 from 5.5 or 5.0 and £49.95 from 4.3 or 4.2. You can still buy version 4.3 for a bargain price of £29.95.

Call Arnor on ☎ 0173 368909.

Time Base Corrected

Electronic Design of Munchen in Germany have announced the release of their latest product – The TBC Enhancer. This acts as a time base corrector, which means it replaces and corrects the control signals on a video signal, allowing it to work with video units like the Toaster.

It can also enhance a video signal by altering the saturation, contrast and luminance of a signal. It can also cope with either composite or S-Video signals. Electronic-Design are on ☎ 01049 89 354 53 03

BBS prizes

The Trick or Treat II BBS is running a competition where the person who uploads the most Amiga stuff could win an 80Mb hard drive or various other prizes.

Trick or Treat II is on ☎ 0703 391797 (Modem).

Disks for books

Bruce Smith Books have decided to bundle disks with some of their existing books, like *Mastering Amiga AMOS*.

All new copies of the book will have thew disk included with it, and anybody who has bought the book previously can get hold of a copy of the disk by sending a cheque for £2 to the publishers.

Their next release will be *Mastering AmigaDos Scripts*, written by *Amiga Shopper* freelance and AmigaDOS-expert Mark Smiddy. Bruce Smith Books are on ☎ 0923 893493.

What goes up

Newton's Law is a new LightWave plug-in that simulates the real world. All you have to do is set the parameters that should apply to your current scene and object and leave Newton's Law to figure out all the bits.

An object can be given a set of physical characteristics from a list of pre-defined materials. You can alter such things as an object's density, friction, elasticity and mass. You can also specify real-world influences such as air pressure, magnetism and wind.

If you would like to find out more call Cybernetica on ☎ 0101 805 730 7330.

FES GETS GOING

The Future Entertainment Show
Earls Court 2
26th – 30th October 1994
CD-Rom • Amiga • Mac • PC • CD-i • Consoles

The Future Entertainment Show is shaping up to be one of the premier events in the Amiga users' diary for the next few months. All sorts of lovely things will be there for Amiga owners, but the throbbing heart of the beast will be the Amiga Theatre. For details of what is going on, check out the timetable on this page.

One of the great highlights of the show will be the chance to ask awkward questions of the people who write *Amiga Shopper*. We will be around in both the 'Meet the Teams' and the 'Question and Answer' sessions, so please feel free to drop by and ask us those awkward questions about all those things that have been bugging you for years. If your questions are particularly technical, please drop us a line in advance as this will give us a chance to check the details of your question beforehand. Please enclose your name, your question and the day you will be attending and send it to :

Ask In Advance
Amiga Shopper
30 Monmouth St
Bath
Avon BA1 2BW

Unfortunately, we can't guarantee an answer to every question, as we only have a short amount of time for these sessions.

We will, in collaboration with *Amiga Format*, be running a series of competitions at the show in a series of categories: Graphics, Demos, Games, DTV, Music, Animation DTP and Miscellaneous. If you have created anything particularly outstanding in any of these categories, just whack it on to a disk with the special label (supplied with *Amiga Format*), and bring it along to the show.

At the end of the day we will be picking one winner, and there will be several stonking prizes, including CD-ROM drives and printers. We will also accept entries on video cassette, as sticking your latest five-hour animation on to a floppy disk could be a problem. All entries must be put into the magic bucket near the Amiga Theatre stage before 11am every day.

There will also be all manner of wonderful things Amiga at the show, including a special area where Premier Vision will be demonstrating the state-of-the-art in Amiga graphics, including the Personal Animation Recorder card.

The FES will run from Wednesday October 26th to Sunday October 30th. Tickets are available in advance for £6, or alternatively £7 on the day. If you buy in bulk, there are also other discounts available. The ticket hotline is on ☎ 0369 4235.

	Wednesday 26th	Thursday 27th	Friday 28th	Saturday 29th	Sunday 30th
11.00	**Meet the teams** with the teams of Amiga Format, Amiga Shopper and Amiga Power	**Meet the teams** with the teams of Amiga Format, Amiga Shopper and Amiga Power	**Meet the teams** with the teams of Amiga Format, Amiga Shopper and Amiga Power	**Meet the teams** with the teams of Amiga Format, Amiga Shopper and Amiga Power	**Meet the teams** with the teams of Amiga Format, Amiga Shopper and Amiga Power
12.00	**Games** Gremlin Get the inside info from a top game company	**Games** Bullfrog Get the inside info from a top game company	**Games** Core Get the inside info from a top game company	**Games** Sensible Get the inside info from a top game company	**Games** Team 17 Get the inside info from a top game company
13.00	**Techie Q&A** Ask tricky questions of our panel of experts	**Techie Q&A** Ask tricky questions of our panel of experts	**Techie Q&A** Ask tricky questions of our panel of experts	**Techie Q&A** Ask tricky questions of our panel of experts	**Techie Q&A** Ask tricky questions of our panel of experts
14.15	**DTV** Gary Whiteley explains Desktop video	**DTV** Gary Whiteley explains Desktop video	**3D Graphics** Andy Bishop talks about PAR and Lightwave	**3D Graphics** John Allardice demonstrates and answers questions	**3D Graphics** John Allardice demonstrates and answers questions
15.15	**16-bit Sound** Andy Bishop and the latest sound equipment	**Music-X** Future Music supremos explain how to use this package	**CD-ROM** Experts show you what can be done and invite your questions	**DTP** Marcus Dyson and his amazing one-man design show	**Judging** Your competition entries discussed and judged by our experts
16.15	**Judging** Your competition entries discussed and judged by our experts	**Judging** Your competition entries discussed and judged by our experts	**Judging** Your competition entries discussed and judged by our experts	**Judging** Your competition entries discussed and judged by our experts	

CompuServe launch Internet services

From the 9th of September CompuServe will be introducing several new Internet services. The communications company will provide Telnet, FTP and World Wide Web services for consumers. It will also provide dedicated Internet and IP access for their commercial customers.

To find out more, or to subscribe to these services, call CompuServe on ☎ 0734 391064. Oh yes, Madonna will be releasing a special preview of her next single on CompuServe.

Trojan Horse warning

We've received a warning from a reader, Urban Mueller, about a file that has just been removed from the AmiNet. The file, "util/virus/vmk30.lha, is in fact a Trojan horse program that will delete your RDB (Rigid Disk Block) after being run for the 255th time.

If you have downloaded this file you would be very wise to delete it straight away.

Please pass this warning on to any BBSs or libraries that have this file.

FAMILY RESEMBLANCE

As you may (or may not) be aware, Future Publishing also publish two other, equally brilliant, Amiga magazines – *Amiga Format* and *Amiga Power*. Here are the Editors of these magazines to tell you what they have on offer this month.



Steve Jarrat
(Editor of *Amiga Format*) –

"The next glorious instalment of the *Amiga Format* experience is already gracing your local newsies' shelves, so you would be well advised to rush out and buy a copy.

The striking cover image of Alfred Hitchcock heralds an issue dedicated to getting into video on the Amiga. We've got a huge feature on how to go about using the Amiga as part of a desktop video suite, and then we round up all the genlocks we could find and rate the little blighters.

Amiga Format's Coverdisks continue to reign supreme with *TV*Text Pro* – a titling program for your own videos – and a fully playable demo of Bullfrog's Gold-rated *Theme Park*. *AF* really is the dog's these days..."

Jonathan Davies
(Editor of *Amiga Power*) –

"*Super Stardust* forms the main thrust of the October issue of *Amiga Power*. There's a monster four-page review of it inside, revealing it to be perhaps the most beautiful game ever created.

Back outside again, and on the cover are three (*yes, three!*) disks featuring playable demos of *Theme Park*, *Alien Breed 2: Tower Assault*, *Ruff 'n' Tumble* and *Bubble & Squeak*.

Inside again (sorry about this), there are reviews of every new Amiga game, along with an excellent feature whereby we connected ourselves up to complex medical equipment to discover if games really are as exciting as real life. Our findings may surprise you."





The latest news from R Shamms Mortier – our man in the US.

Nova Design

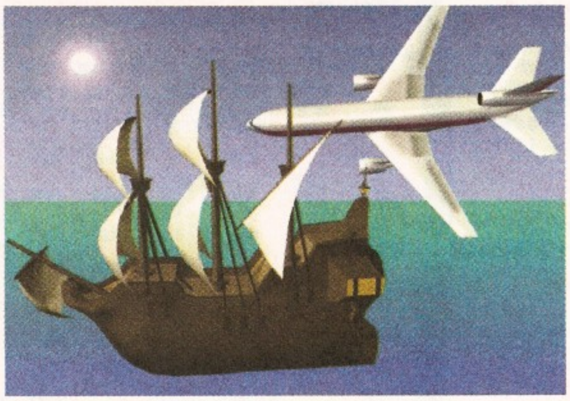
Nova Design's ImageFX 2.0 (a real beauty) ships in mid October. There is an English distributor that is a pirate in the London area who is ripping off Nova Design (ImageFX), if not others as well, by selling pirated copies of ImageFX software. This same low-life has the gall to be advertising in another Amiga publication from England. The pirated versions of ImageFX are selling for £100.



Amigans, rise up and stop them. Get the name of these slime balls from Bob at ImageFX by calling ☎ 804-282-6528, and spread the word to your honest (and hopefully outraged) friends. Piracy kills development.

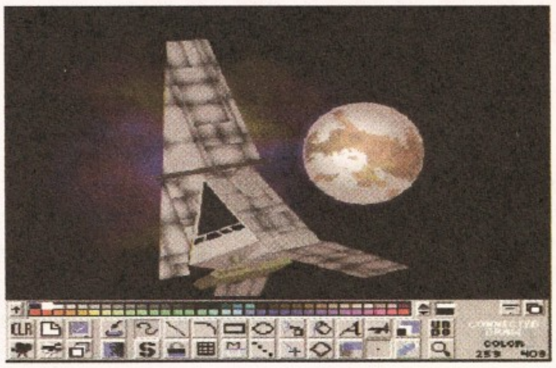
Lightwave to go to NT?

U.S. Distributor Devware is becoming more devoted to Toaster/LightWave products at the moment, since it looks like LightWave will remain a winner in the ongoing Commodore saga. Their business has been dramatically hurt by the Bahamian indecision, being off by some 40%+. They said that LightWave for Windows-NT would be on the market in December, and they will add Windows-NT stuff at that point. Why is this important to Amiga users? Simple. The more LightWaves out there, for any platform, the more this is going to increase the speed of development and enhancement and eventually drop the price for everybody. Windows users represent a very big potential market. The question is, can NewTek penetrate ☎it effectively? Newtek are on ☎ 0101 843- 8934, Devware are on ☎ 0101 800 879 0752



PLAY DIGITAL CREATIONS

Digital Creations is merging with Paul Montgomery's PLAY, Inc. and will now be known under that same name. Paul Montgomery and the rest of the folks at PLAY were the major players in the group that left (was let go) by NewTek a couple on months ago. The new group will be very serious about developing new products for computer graphics and animation (there first product will be a state-of-the-art 3D video digitizer for animation modeling purposes. Whether it will be available for Amiga users or not depends on how quickly and effectively the whole thing comes back together again. Don't look for any instant support of LightWave projects from PLAY, since bitterness still abounds on all fronts. The Digital Creations group is also not anxious to give NewTek a hand, since D.C.'s wares always had to fight NewTek for command of the Amiga Video Slot inside the Amiga.



I also asked Greg at Digital how well Brilliance was doing since they de-dongelized it for the 2.0 release. He said that there was no indication that major piracy was hurting it so far, but that they were still watching the known pirate BBS boards for its appearance. Whether or not the DCTV Paint software will be upgraded in the near future (I got the distinct impression that major work has already been done in this direction) depends on how fast the Amiga gets back in the swing of things. Digital Creations are on ☎ 0101 (916) 344-4825

On Impulse

Mike Halvorson of Impulse says that their 3D digitizer will ship by September 15th. The price for 30 days will be $500.00, then double that afterwards. Impulse has invested over $140,000 in the hardware development. It will work on any system through the serial port (software for the MAC and SGI due to ship by November). A cheaper "articulated arm" digitizer will be produced and sold for about $500.00 in the future. Right now, the Amiga software for the digitizer supports Imagine and DXF files.

UTILITIES UNLIMITED

Jim Drew of Utilities Unlimited will talk to us in a future interview. I've just or-dered the 486-DX emulator, and will have something to say on this as time goes by. Drew also told a friend of mine that there's a way to add a MAC open architecture box to his Emplant emulator so that MAC cards can be added, but no details ever surfaced. Anyone ever heard of this possibility? I'd like to know if it's true, and how to do it.

Big bad Buster

I'm one of those A4000 owners who purchased their system early on, and consequently got the earlier Buster Chip as a result. I never bothered to upgrade, not really needing SCSI-II compatibility at the time. Well, after Commodore nose dived and parts became scarce, wouldn't you know it, I needed to upgrade to the revision 11 Buster. Nobody was out there. SMG, the company that Commodore chose as the one to address this fault, is about 4000 orders behind as far as the Buster upgrade, and they don't expect to be able to do anything until at least November. After a three week search, I found a company in Florida that will handle the repairs (they're getting their supplies from England!). They are Intelligent Machines of Orlando (2923 East Colonial Drive, Orlando, Florida, USA 32803 / 407898-0521). They'll do the upgrade for about $110.00

UK Aladdin 4D

Greg Gorby of ADSPEC Programming is looking to penetrate the European market more successfully in the Fall with the release of Aladdin 4.0. Look for his approach to be made public sometime in October or November. ADSpec are on 0101 ☎ (216) 337-1329

Address Change

Tim Shead, owner of Shead Design and software and developer of Shead Tools for Aladdin-4D ($30.00 and selling like hot cakes over here) has a new address. It is: 4610 Eubank Blvd. NE, #118, Albaquerque, New Mexico 87111. New Phone is 505-237-8679

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WARNING

Due to the exchange rate, or manufacturer's changes or due to current RAM shortage, some prices may alter, either up or down, during the several weeks between going to press and the end of the month of issue. We would ask that prices be confirmed by telephone before ordering.

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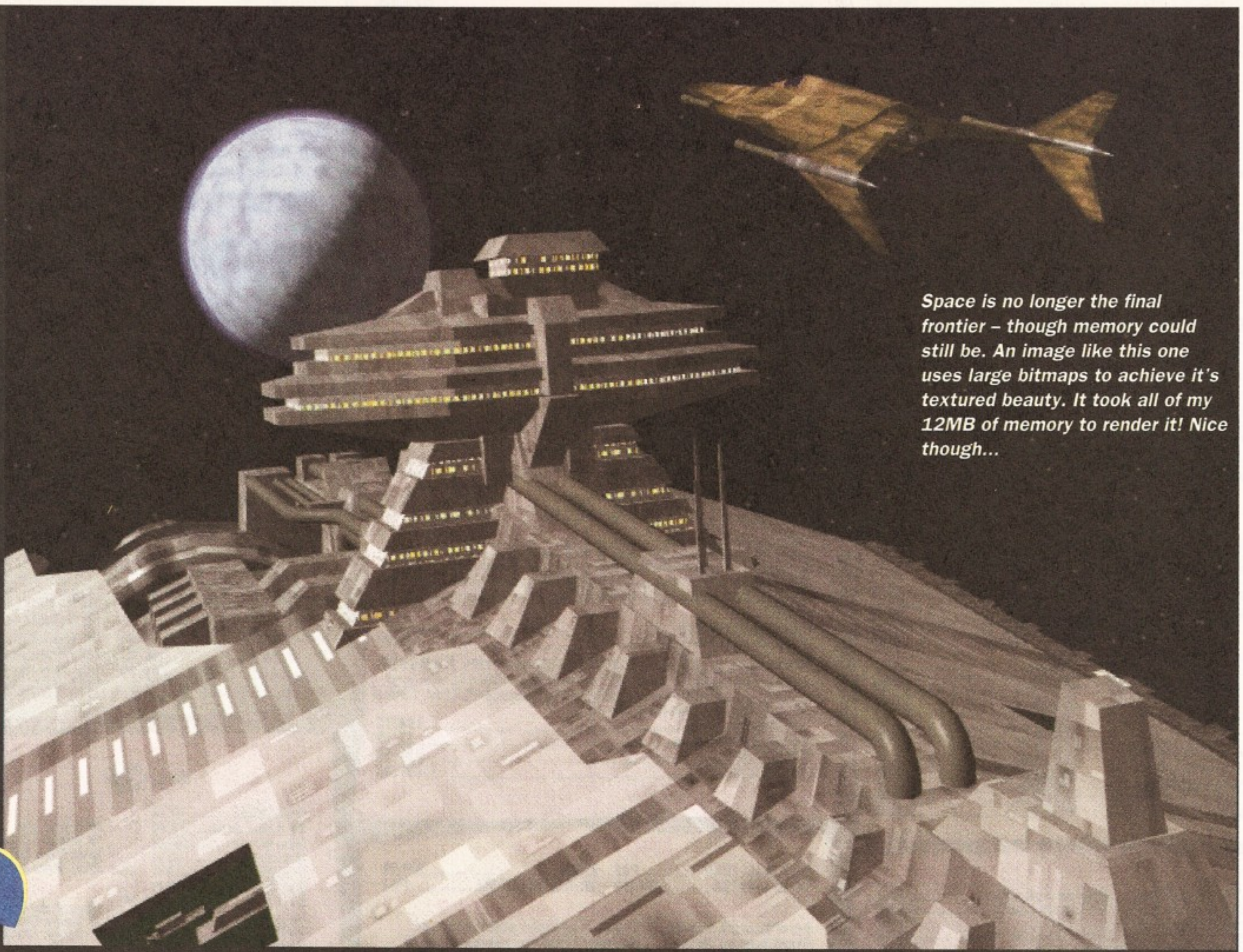
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LightWave 3D



Space is no longer the final frontier – though memory could still be. An image like this one uses large bitmaps to achieve it's textured beauty. It took all of my 12MB of memory to render it! Nice though...

Gary Whiteley finally gets his hands on the standalone version of LightWave 3D. Can it bring 3D to the masses?

Imagine my surprise when a NewTek representative at last April's European Computer Trade Show asked me whether I thought LightWave 3D should be released independently of the Video Toaster and what it should cost? Was he serious? Had NewTek dreamed this up on their own or had the years of complaints and suggestions from European, Australian and other PAL 3D-ers finally paid off? Of course, my answer was a resounding "Yes!".

I wasn't the only one he asked (though I'm glad he did, because I had been advocating a standalone LightWave for a couple of years). Obviously the collective response was positive because at long last NewTek have finally seen the light and graced the rest of us with a Toaster-free version of LightWave 3D – one of the most exciting 3D animation and modelling packages available on any PC this side of a Silicon Graphics workstation.

But why did NewTek take so long to release a standalone version of LightWave 3D? After all, the Toaster had been around since 1991 (Phil South and I did the first UK review in AS 6). The official line is that NewTek didn't think that LightWave 3D was ready for the market, but my guess is that NewTek were incensed by the release of the rival LightRave which they wanted to kill off.

As for LightWave not being ready, phooey! As part of the Toaster, LightWave had been knocking the socks off animators for a couple of years and had already contributed to much award-winning and excellent work – including the animation segments produced for Babylon V and seaQuest DSV.

Then there was the recently-released Imagine 3, which could also have been perceived as a threat to LightWave, especially in PAL-city. I also suspect there was something going on at NewTek which required cash... Last year eight key staff left, while this year eleven (according to the story I heard) NewTek employees were made redundant, and there are still ScreamerNet/Raptor and Flyer products to get out. *(Actually, we have a feature on the first Raptor in Europe on page 22 – Ed)*. So releasing LightWave 3D as a standalone product makes sense if NewTek needed to get some extra cash together without too much additional work.

After all, if Warm and Fuzzy Logic could hack LightWave away from the Toaster to produce LightRave why couldn't NewTek release it as a standalone product as only a part of the 3D software was directly linked to the Toaster? And, let's face it, the NTSC-only Toaster was the biggest obstacle to selling LightWave in PAL countries. Whatever the reason, LightWave 3D is available, in PAL and possibly overpriced, but certainly over here.

OPEN THE BOX

At last! And it works on any suitably-equipped Amiga. So what's all the fuss about and what do you get after you've shelled out almost £500 for the privilege of owning LightWave 3D? Well, you get seven disks containing the software itself (including both normal and FPU versions) plus example objects: ARexx macros and some fine PostScript fonts, two manuals (one based on Lightwave 3.1 as previously bundled with the Toaster) and an addendum describing the new features of LightWave 3.5 – the current version.

WHAT'S INSIDE?

There's also a tutorial video tape (in PAL VHS) from Lee Stranahan's excellent Toaster Essentials series, a dongle that fits into the parallel port of your Amiga and a letter which sort of apologises for the quality of the manuals, but which doesn't promise any free upgrades to something better in the future. This latter is odd, because the last I heard was that noted LightWave animator John Gross (of Amblin Imaging, who did the seaQuest DSV animations) was going to writing new tutorials to be included in a new, full version of the manual.

A word of warning about the dongle! Although it has a parallel pass-through, NewTek recommend that you don't use it and that you incorporate a parallel switch box into your system if you have other parallel devices (such as printers or digitisers) which you regularly use. This is good advice because I found that if I had my printer connected to the pass-through then it had to be

switched on or LightWave wouldn't recognise the presence of the dongle and would exit as soon as the first mouse click was made. Although most programs manage to print OK via the dongle Protext (which uses its own proprietary printer drivers) refused to recognise the printer at all. But perhaps the worst failing of the dongle is that it disables PARNet, so you can kiss goodbye to cheap networking if you plan to use LightWave 3D!

LOOKING AT THE LAYOUT

I'll start with the best part of LightWave 3D – the Layout module. This is Allen Hastings' baby, whom old timers will recognise as being responsible for creating one of the Amiga's first 3D programs, VideoScape 3D. Over the years Allen has taken the basis of that early software and refined it into the supremely usable Layout program which is the hub of all things animatable in LightWave.

Layout is the stage area of LightWave 3D, where all the components which produce the final animation or still frame are assembled. Layout is where objects are placed, lights are set up, textures and mapping set, the camera positioned and motion paths assigned to all or any of the loaded elements. Layout is awesome in its power, though there are still a few rough edges – which I'll mention briefly later.

First, a guided tour of all the good things Layout has to offer. Layout has one main screen, surrounded by a variety of menus, which displays the current stage scene from one of several views. This can be from the camera itself, one of three planar views (top, side or front); a perspective view; or from the position of any currently selected light. There are no tri or quad views (as is common with other software) but this is no obstacle to easy working – you just flip between views as necessary.

You load every object which is to appear in the scene into Layout and, if the outcome is to be an animation, you can set up key frames for each object, light and camera in the scene. You can make key frames as often as you need them simply by selecting the object to be key-framed, the frame number for the key frame and pressing the Return key twice. Any sizing, rotation and positioning information for the object (or light or camera) is then stored. During an animation each object's position is smoothly interpolated from one key frame to the next using spline paths which, results in smooth, fluid motion. However, should you require more than a simple continuous move from A to B to C there are several tweaks you can make to set such effects as ease in and ease out for the path of each object (or part of a path). The Layout key framing system makes it easy to set up animations and if you are unhappy with the position of an object you just move it and remake its key frame.

However, there are times when I wish there were an option to change the omnipresent wireframe views to ones with solid, hidden line representations to avoid the confusion of not always being able to see just how each object in a scene would be obscured by others in front of it.

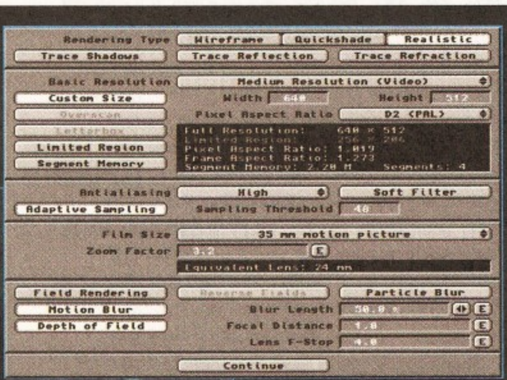
At any time during the layout process you can make a quick wireframe or bounding box (where just a box represents each object) preview of the current view to check that the motion is OK and then to play the preview back at various frame rates of up to 30 frames per second.

SURFACE EXTENSIONS

But Layout's versatility doesn't stop there. In fact, as powerful as key framing is, setting up an animation is just the tip of the iceberg as far as Layout's features go. Layout is also the place to assign image or texture maps to surfaces (which are defined in the Modeler) and modify the colour, glossiness, reflection and other attributes of a surface. There are several different kinds of mapping technique available and several ways of wrapping images on to objects – including planar, cubic, cylindrical, spherical and displacement mapping – as well as bump, reflection and other types of texture mapping.

One gripe I do have is that the LightWave 3D texturing techniques don't include nearly enough procedural (algorithmic) textures. As a result most of the textures that you might need you first have to import as bitmaps: either from grabs or scans, paint software or from texture programs such as

Like many of the requesters in LightWave, the rendering options screen, right, will scare the whatever out of many a 3D novice. Don't panic! You can ignore most of the options to begin with.





Left: both depth of field and motion blurring are in use here. The former brings only certain regions of an image into focus, while the latter adds realistic blurry edges to moving objects. Motion blurring is particularly useful for producing convincing animations of fast-moving objects.

What Richard Baguley thinks of LightWave

Richard Baguley is the *Amiga Shopper* editor and a long-time Imagine user.

LightWave is certainly an extremely easy-to-use program. It is very easy to produce some absolutely stunning results. It's especially suitable for somebody with a photographic or film background (like me), because the layout editor works in a similar way to a photographic studio. However, unlike when you use a studio, with LightWave you don't have to pay somebody to lug your equipment around for you and the models are cheaper as well.

At first, I found moving and rotating objects a little confusing (as the direction is determined by which mouse button you press), but you overcome this initial disorientation fairly quickly.

The Modeler is similar to the Layout editor – initially confusing but incredibly powerful. It's obvious that this program has been the result of several years of evolution. It is also clear that the programmers have followed suggestions from the right people – the professionals who create some of the stunning animations that you will have seen on TV recently in programs such as Babylon 5 and seaQuest DSV.

However, I was somewhat perturbed to see that the program was not yet completely stable. It crashed out on me several times and I suspect that this was to do with memory problems as I was working with large objects in high resolution modes at the time.

However, this isn't really an excuse – I would much rather it came up with a message telling me: 'not enough memory' than just carrying on regardless.

I must admit that I was also a bit disappointed with the manual. Although the ease of use of a program such as LightWave means that you shouldn't need to consult the manual that often, I would have preferred to see more information on some of the more complex modelling tools in the program. However, that being said, there are some good tutorials in the manual.

The addition of a video does help matters, but this doesn't cover the Modeler, which really is a great pity.

> **"It's especially suitable for somebody with a photographic or film background (like me)."**

What R Shamms Mortier thinks of LightWave

LightWave 3.5 is the most Amiga-friendly version of the Toaster modelling and animation software that NewTek has ever produced.

The new version takes advantage of the super viewing capacities of HAM8 resolution screens but not only as a token addition. You can actually see the results of your modelling on a native AGA screen in what looks like a 24-bit representation. As for 24-bit work, if you are lucky enough to own a Picasso board, you can see the rendering in real 24bit. Why they support only the Picasso and not the Retina or OpalVision hardware, only NewTek knows. I wish it was retargetable even beyond its present limits, but this is a good start. At last NewTek is on record in the docs as actually inviting third party development instead of legally discouraging it.

Hooray! At last there are slider buttons for numeric data. I have always disliked having to change data by typing it in. You can leave that to the Lotus folks. The Amiga is a visually manipulatable environment, and should be written for as such.

I confess that I'm a sucker for lens flares and that I have been ever since they were introduced in LightWave 3.0. I appreciate the new fade option that allows a light to automatically fade as its distance from the camera increases (previously you had to use a CSpline curve to control the fade).

I'm sure that another flare effect 'Glow behind Objects' was added in response to the animators at Amblin because of their SeaQuestDSV needs (when lights are added to vehicles under water). I really like the fact that the whole LightWave community can benefit as a result of this addition.

I think the cost of the upgrade to Toaster owners is a bit steep (about $100.00). After all, this is a midcourse correction and the full 4.0 software is due out in the autumn. The 4.0 software will, as I understand it, be a whopping wallet banger, so it would have been nice (and would have been an appreciated 'thank you' to all the dedicated Toaster owners) if the cost for this were to be somewhere in the $50.00 range. This is great software, however, and LightWave users new and old are going to flip over it even more than usual.

By the way, even with my minor complaints, thanks to LightWave for staying around.

> "The 4.0 software will, as I understand it, be a whopping wallet banger."



Left: taking a leaf from seaQuest DSV's book I constructed this underwater scene using lens flares and fog settings



Right: LightWave gives you a quite unnervingly large amount of control over the lens flare of lights, although rendering times can be increased drastically by its overuse.

Apex Software's Forge/Essence combination. The good news is that Apex is actively working on porting its Essence textures for LightWave and that these should appear by LightWave 3D v4. Until then it's a matter of sticking with the half dozen or so textures or using bitmaps.

If you have seen Babylon V or seaQuest DSV you were no doubt impressed by LightWave's lighting effects. Again, lights are under the command of Layout and there's a lot of scope for some wicked effects, including the best lens flaring around and three kinds of lights – distant, point and spot – each with its own uses. Each light also has its own pop-up menu and wide range of settings is available for each. Interestingly, many of the settings were developed at the request of Amblin Imaging to enable realistic underwater scenes to be constructed.

SEE IT IN THE RIGHT LIGHT

If you wish you can set up each light differently and, to save time, you can make spotlights cast shadows using a shadow mapping technique which can be substantially faster (and often more realistic) than ray tracing. Of course, you can animate any light and, like objects, you can parent a light to any other object to make animation easier. Then there are the camera settings, which include such regular features as defining the rendered image size (which now includes PAL sizes and custom settings to produce images up to 8000 pixels square – if you have enough memory!).

The Camera menu also includes settings for antialiasing (off, low, medium and high) and other aids such as adaptive sampling, aspect ratio and lens settings. It is here that you decide what quality and resolution you need to render at – with wireframe, quick and realistic rendering settings all available – and options to trace shadows and so on. But don't worry if it sounds complex, it isn't, and you'll easily get the hang of which settings you need to make in the Camera menu.

Once everything is set it's render time and there are more choices for you to make. Do you want to save each image as a 24-bit or Targa format file? No problem. Would you like to make a colour animation as well? Then do it – from a choice of six-bit or eight-bit HAM (for AGA Amigas). If you have the right video equipment and interface you can even record frames direct to single-frame VCRs and digital disk recorders such as the DPS PAR, as well as top end broadcast devices such as the Abekas digital recorders.

WHEN IT GETS COMPLEX

Rendering can take a while depending on the complexity of the scene; the number of lights and their attributes and the resolution and antialiasing settings in use (saving frames can eat hard drive space like there's no tomorrow). But no-one promised that 3D animation would be easy and cheap – even though LightWave 3D runs on almost any suitably-equipped Amiga. If you don't have an accelerated Amiga (and a fast one at that) be prepared to wait a long time for quality results. This isn't the fault of LightWave which goes as fast as it can under the circumstances. A Ferrari body fitted with a 50cc engine won't give Ferrari performance and neither will a low-performance basic Amiga compared with a 40MHz 68040-based model.

You can save all the information about the

CROSS-PLATFORM FUTURES

For the future, NewTek has announced that it will be releasing PC, DEC Alpha and SGI versions of LightWave 3D, with the SGI version predicted to retail at under $1000. This will certainly put the cat among the pigeons as far as expensive 3D software such as SoftImage and WaveFront are concerned. And with the PC version likely to cost substantially less than the current leader 3DStudio, NewTek could well make serious inroads into 3D markets on these other platforms. But who can blame them for diversifying? After all, the future of the Amiga remains infuriatingly unclear and for NewTek (or any other serious developer) to remain hitched to a possibly soon-to-be-extinct machine just doesn't make good business sense.

What Craig Collins thinks of Lightwave

Craig Collins is a noted 3D animator who has produced a wide range of animations which have been released into the Public Domain. Craig also produced last month's excellent cover using Imagine, which he has been using for several years.

Making the leap from one 3D package to another is not a simple matter. I have used Imagine for years and I'm comfortable with its interface. Learning a new 3D program was not something I was looking forward to.

However, I found that the LightWave manual was light years ahead of the Imagine handbook and that it was an easy read. This helped me enormously.

LightWave has two main editors

- Layout, and
- Modeler.

Imagine had six so automatically there is less jumping around. LightWave also gives you information in big sub menus so there is not so much running around to find a parameter that you want to alter.

In Layout everything is easy to use and most of the functions will be easily understood by a typical Imagine user. The only weakness that I could detect was in the texture sub-menu of surfaces. There are few in-built textures compared to the 100+ which are included with Imagine. This means you have to rely on memory-hogging image maps.

The bones in LightWave are much easier to use than those in Imagine. They enabled me to control and animate contiguous objects with a great degree of control over orientation, scaling and movement. Clip maps also help to cut down on modelling work. Creating a tree or a fancy font is a breeze with the bonus of a low polygon count.

The second editor in LightWave is Modeler, which is extremely straightforward to use. Imagine users will immediately feel at home here. The feature I liked best was the fast and accurate slicing tools Imagine is very buggy and slow in this respect.

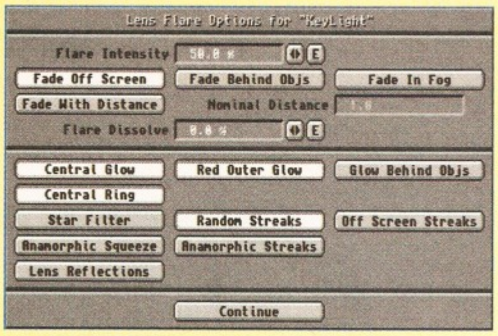
I have also had fun with spline patching. With Imagine I wouldn't have liked to attempt to build an object such as a dinosaur because of the curves involved. However with Modeler, I have almost finished making a raptor with spline patches, which are very fast and easy.

Overall LightWave comes highly recommended and is now my number 1 3D package. No more Imagine for me!

"LightWave comes highly recommended."

LENS FLARES, BLUR, DEPTH OF FIELD...

LightWave was the first Amiga 3D program to incorporate lens flares (which emulate the accidental lighting effects caused by camera lenses). There are quite a number of mix and match flare styles available, and a lot of control over them. LightWave's lens flares are far more convincing than Imagine 3.0's half-hearted attempt. Unlike Imagine, LightWave 3D can do motion blurring to produce more convincing movement and (like Imagine) LightWave's camera can have depth of field set so as to determine just where an image becomes in and out of focus.

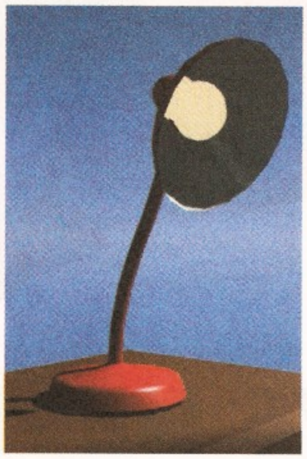


The LightWave lens flares are really second to none and there are quite an astonishingly large number of options to control them.

current scene as a scene file for later recall and you can selectively replace objects as and when necessary. For instance, if you had a complex space fighter scene using large, detailed objects it is easier to get the motion right using simple shapes – even just blocks – and then swap the blocks for the real objects later. Replace allows you to do just this. By using the Scene Overview, you can tell Layout which objects and lights to display, helping to keep on-screen clutter to a minimum.

IT ALL HANGS TOGETHER

LightWave had bones long before Imagine 3 had them and the Lightwave bones have always been a lot easier to set up. In most cases it's simply a matter of making a bone (by clicking a few requesters), scaling it and then attaching it to the relevant point of your object. Then, over subsequent key frames, you shift the bones and the object distorts to follow them. It's important that the objects surfaces are subdivided reasonably into small triangular faces otherwise the object's flexing won't be as smooth as it should be. So get those anglepoise lamps out ready for your own remake of that classic computer animation 'Luxo Jnr'.



So what else is there to Layout? Quite a lot actually! Many of the user-definable parameters also have 'envelope' settings which enable them to be sculpted over time, for example during an animation. If you want to fade a light down over 20 frames or zoom the camera in, for instance, do it with an envelope. It's easy!.

What about fog, backgrounds, motion blurring, alpha channel rendering, object dissolve, clip mapping, sequenced image mapping, field rendering, depth of field settings and ARexx macros? Well, they are all here, together with lots more. The collision detection routines are missing but otherwise Layout includes almost everything a computer animator needs except comprehensive 24-bit display card support. However, even this is said to be coming as each manufacturer prepares drivers for their cards. For now, though, Layout only supports the Picasso II card directly, but there are ways around this.

What else can I say? Layout is the easiest way to animate on an Amiga. Period.

HAND IT TO MODELER

No, it's not a spelling mistake. That's how they spell modeler in the US of A and since LightWave 3D is an American program that's how I'll spell it here. Modeler is the LightWave props and construction department where all the objects which are to be used in a scene are prepared or modified. If you are an Imagine or Real3D user be prepared for a change of perspective – Modeler has its own way of doing things – and if you are like me you might have a hard time getting to grips with the Modeler approach to building objects.

Modeler takes the ubiquitous 'Tri-View' approach which so many 3D programs use, but it takes it several steps further because it also has several 'layers', each of which can be used to model separate objects (or parts of complex objects) before the whole object is saved out.

Modeler is packed with modelling tools and gizmos for making just about anything you can imagine. The trouble is that the tutorials in the manual hardly get involved in the hows and whys of sculpting objects with Modeler – at least not beyond a few fairly simple objects and concepts. It's really frustrating be able to read the technical descriptions of how the various tools work but then have to work out which ones you need to use to make an object.

There are the usual primitive objects (ball, disk, cube, for example), a freehand drawing mode for making curved edges and you can add **all the usual stuff**. Yet since I have been using Modeler I have spent long periods trying to work out how to make an object before giving up and returning to Imagine to build it there. I can't pinpoint why I have these problems with Modeler. Perhaps I find its concepts confusing and the lack of tutorial information doesn't help. Still, there's undoubted power here and in the hands of a 3D alchemist Modeler can certainly do the business.

If it's 3D text that you want, however, in Modeler it couldn't be simpler. Import a Postscript font and turn it into bevelled 3D text in minutes. To cut shaped holes in an object (or a number of variations on this theme) create your base object then make the shapes to cut the holes before using one of Modeler's Boolean operators.

MEET METAFORM

Perhaps the best new tool (which, incidentally, is making its debut in LightWave 3.5) is Metaform. This lets you take a basic primitive-like shape and subdivide and sculpt it into a new, smooth-looking object. Jaw-dropping reports from the US speak of car bodies being rapidly carved from rectangular blocks by this method, but I wasn't able to copy

THE GOOD, THE BAD AND UGLY

For the impatient and the magazine rack browsers here is a summary of the major achievements (and also the under-achievements) of LightWave 3D.

LAYOUT – This is where the actual animations are choreographed and rendered. Lights, camera, action is the name of the game and Layout mostly works extremely well. With its ease of use and great features like bones, spline paths, a variety of mapping techniques, multiple lighting styles and range of other options, Layout is probably the most powerful 3D animation interface around, and, like Modeler, it has full ARexx support.

Layout can also load objects in a variety of external formats, including AutoCAD DXF, 3DStudio, Sculpt3D, WaveFront and Swivel, though Imagine format objects still aren't directly supported. There are a few snags, however: the 24-bit display support isn't what it should be and the only directly supported card so far is the Picasso II. Non-AGA owners will also suffer in that the colour preview of each rendered frame is only in HAM at best.

Also, the actual rendering screen is still only NTSC-sized, so until a frame is fully rendered it's impossible to see whether it is framed correctly or not. Also, saving 24-bit RGB images seems to take a long time compared to, say, OpalPaint. Why?

MODELER – From its early days as the modeler for Videoscape 3D I've always had problems with Modeler. The latest version is no exception, though I think that I've probably become biased because of my long-term familiarity with Imagine's modeler. Because of the lack of tutorials for Modeler I'm still left with a lack of confidence in my abilities to model successfully with it, though it's obvious that great objects can be produced by those who have had plenty of practise.

Modeler has quite a high learning curve and the lack of thorough documentation means that this vital aspect of LightWave 3D appears to be the weakest part of the package – especially if you are a brand-new user.

MANUALS – Behind their stylish design the LightWave manuals are not that great, actually. The contents of the main manual have been lifted directly from the full Video Toaster 3.1 documentation (no real worries there) but no-one has thought to update the subject index. This means that it sometimes turns out that a particular subject isn't on the page the index says it is.

Additionally, the tutorials for Modeler are very poor and I became frustrated that I had a hard time understanding all the concepts that were necessary to build anything but the simplest objects. The inclusion of a tutorial videotape in the package is great, but I'd have preferred one with more on LightWave's Modeler, rather than Layout, because this is the most under-informed area of the current LightWave 3D.

this myself due to the cursory mention that Metaform gets in the Modeler documents.

Modeler also has spline patches, the usual lathe, deform, modification and extrude tools (plus unusual variations), several drilling tools in addition to the Boolean operator, as well as many other useful-looking tools which add up to a very flexible modeler (if you can work out how to use everything). However, perhaps the best thing about LightWave 3D, is that it can use multiple-sided single plane polygons, rather than the triangular polygons often used in other software (Real3D excepted) with the result that large flat faces look smooth and flat when rendered.

As I said, I'm still getting to grips with Modeler but that shouldn't be barrier to your using it – a lot of folk already do and successfully so. Just be prepared to forget some of your previous 3D knowledge or, if you're new to 3D, get ready for a learning experience!

REQUIREMENTS

Any Amiga (except the A1000) with at least 8Mb of RAM and a large (at least 120Mb hard drive, say). Recommend extras are a 24-bit display card and an accelerator with FPU. A DPS PAR or single-frame capable VCR and controller would also be useful if you are seriously into 3D animation production. AS

Gary Whiteley can be e-mailed as drgaz@cix.compulink.co.uk

WHAT
LightWave 3D – £499
WHO
NewTek Incorporated
WHERE
Silica Systems ☎ 081 308 0888

CHECKOUT
LightWave

Documentation 86%
Two bound documents are provided, one being culled from the original Toaster manual for release 3.1, the other being an addendum for this version, 3.5. The indexing is inaccurate while the manuals contain both typos and omissions and the Modeler tutorials are rather poor. Yes, it's better than nothing, but it's really not up to scratch at this price.

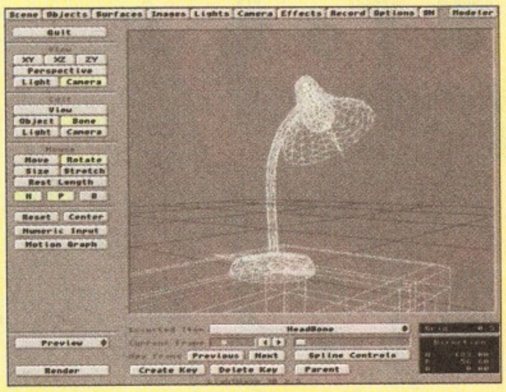
Features 95%
There are loads of great features, though I wish that more algorithmic surface textures had been included.

Ease Of Use 88%
Layout is great and setting up animations is pretty easy – certainly better than the competition – but Modeler could do with some improvement, particularly with regard to its documentation.

Price 80%
Knock £150 off and LightWave 3D would be an excellent buy. As it stands, however, I think it is priced rather too highly to appeal to the mass market which NewTek seems to be courting.

Overall 89%
LightWave 3D is an excellent program, but it is let down by its overpricing and rather lacklustre documentation. The inclusion of a tutorial video for Layout is a great idea, but it is the modelling side which really needs addressing – in both tutorials as well as in an improved manual. But after using it side by side with Imagine 3 I know which one I prefer!

THEM BONES, THEM DRY BONES...



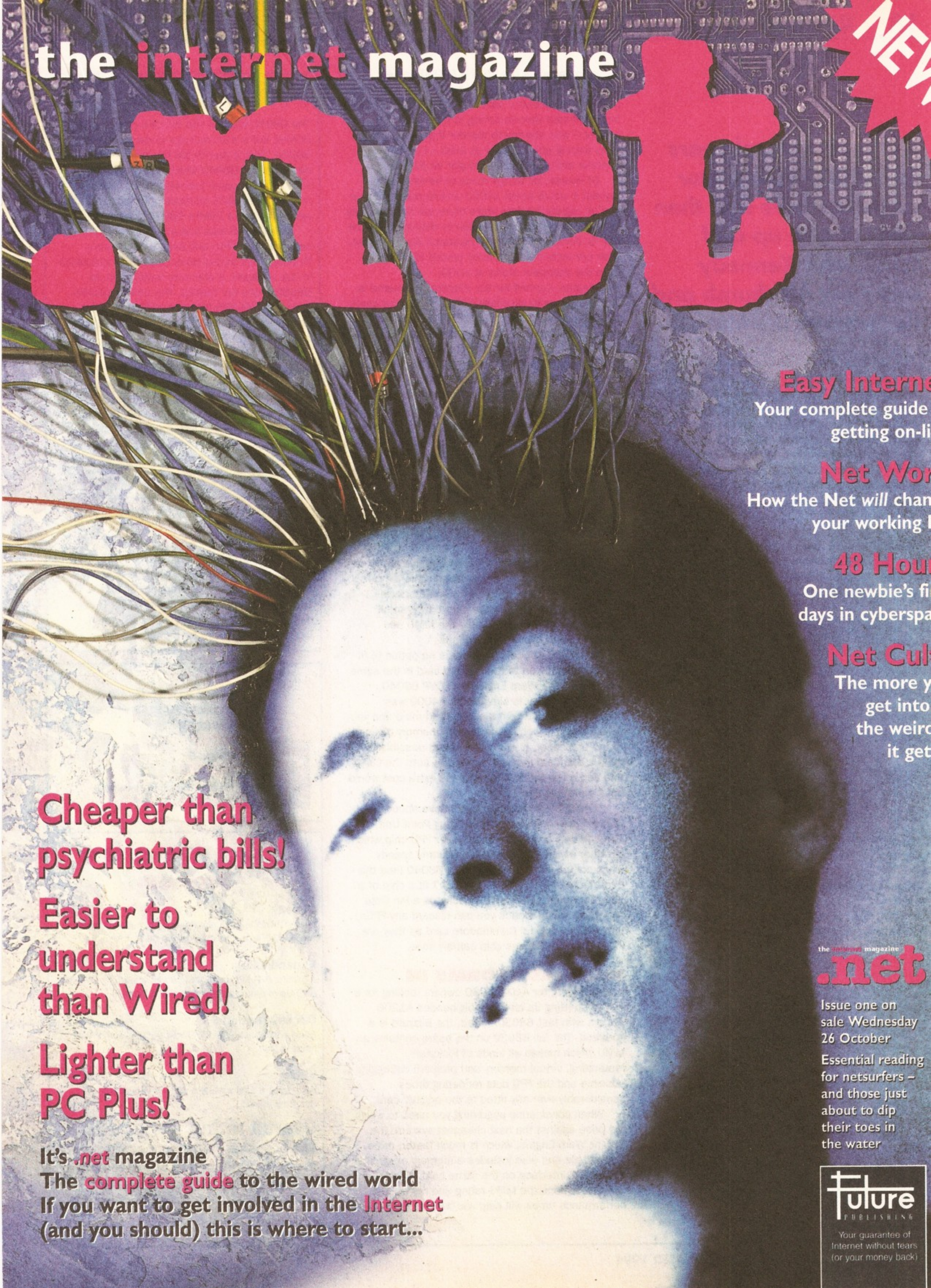
Producing realistic limb-like (and other) movement, above, is easy using LightWave's bones. Clip bones to an object, move and rotate them over a series of keyframes and, hey presto!, a living object.

In comparison with Imagine's bones (which are very fiddly to set up) the LightWave bones are a cinch to use. It's pretty much a process of pick your objects (which should be reasonably well subdivided into triangular faces), make the bones, and size, position and rotate them across several keyframes and you're in business...

The illustrations, below, show a desk lamp being manipulated by bones. It took me about five minutes to set it up.




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Blizzard

You wait several years for A4000 accelerator cards to arrive and then several turn up and once. John Kennedy sticks out his thumb and flags down the latest.

Like many Amiga owners I sometimes need to question myself over the 'more money than sense' scenario with regard to Amiga hardware. For reasons which seemed good at the time, I bought an A4000/030 rather than an A1200. However, although the extra expansion slots have been extremely useful to me (as has the easy disk drive fitting), the growing number of exceptionally fast A1200 speed-up cards has proved to be an irritation.

Trying to speed up the 25MHz 68030 present in the A4000/030 used to be a tricky business. Many promised accelerator cards (Photon and Hellfire from Software Demon spring to mind) didn't appear. I was starting to wonder if perhaps – from a ray tracing point of view at least – I had made a mistake and should have bought an A1200.

Of course, all things come to he who waits (except it would seem A4000 on-site maintenance) and as regular readers know there are now two jolly fast 68040-based accelerators to choose from (the GVP G- Force and the MacroSystems Warp Engine). Both are extremely advanced pieces of kit, but even the cheapest starts at £600.

Prepare yourself for the Blizzard. The name is synonymous with excellent A1200 expansion cards and it's possibly the saviour of A4000/030 owners everywhere. Not only have the fine folk at Phase 5 developed a stonkingly fast 50Mhz 68030 system, but they have also done it for a bargain price: less than many similarly priced A1200 cards.

Physically, the Blizzard card looks almost identical in size and shape to the original Commodore card and fitting gets easier the more you are prepared to disassemble your computer.

The first time I removed the processor card from my A4000 I needed to strip the machine bare: hard drives, floppy bay, front panel, daughterboard – I removed them all. Now I can fit a new processor card simply by removing the top lid. Some A4000s have jumpers which need to be set, but even doing this only takes seconds.

Switch the power back on and everything is as it was. You don't need any software: this is real 'plug and play' technology. If for some bizarre reason you need to slow the card down, small jumpers are present to disable the MMU and internal processor memory caches.

You might wonder why there is no option to fit memory directly on to the Blizzard card in the same way as with the Warp Engine and GVP 68040 cards. The answer is simple: the A4000 was originally designed with the 68030 in mind and you wouldn't gain much by moving the memory closer to the processor. It would have been possible to build a standard memory expansion onto the card and add a few SIMM slots, but the extra cost would not have made it worthwhile.

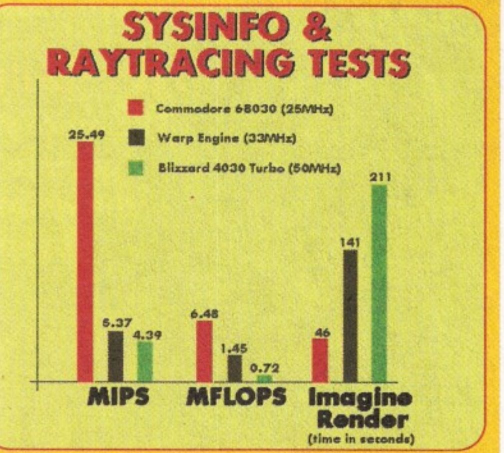
In fact, the only complaints I have about the Blizzard are confined to the Floating Point Unit. There is only an option for a 50Mhz FPU chip which is rather expensive and not particularly speedy when compared to even a 25Mhz 68040 (see the performance graphs, left). You can't fit a chip of a different speed and the FPU socket is a Pin Gate Array type which means you can discard any FPUs fitted to the original Commodore card as they are PLCC (plastic leadless chip carrier) style.

BLIZZARD STORMS IN

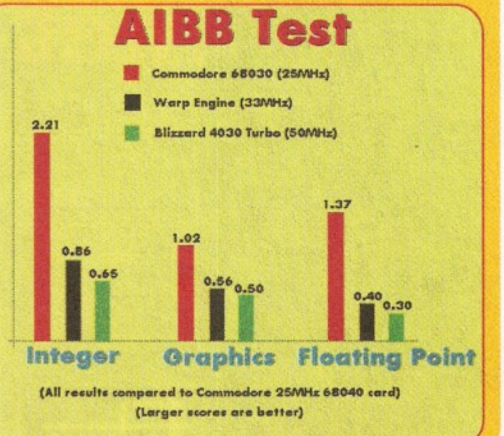
In conclusion, for A4000/030 owners looking for a way of shutting up all those big-headed A1200 owners with fast 68030s fitted, the Blizzard is a godsend. The full 68030 on the board contains an MMU which makes all kinds of Kickstart remapping, virtual memory and program debugging possible and the FPU cuts rendering times considerably over any fitted to the original card.

When considering upgrading you need to weigh the price against the next cheapest system: the 28Mhz Warp Engine, which is much faster, more expandable and also includes a memory expansion and SCSI2 interface on the same card. A tricky choice. Perhaps the MIPS rating and ray tracing performance times will help you decide.

Sysinfo is a quick and cheerful way of getting MIPS and MFLOPS ratings. We also rendered the same image using the three cards and noted the time required in seconds.



The Amiga Intuition Based Benchmark program tests as many aspects of an Amiga system as possible. The Blizzard is good, but look how a 33Mhz Warp Engine overshadows it.



68030 VS 68040

The 68030 fitted to the Blizzard runs at a nippy 50MHz but it still can't get close to a 25MHz 68040. This is due to the much improved design of the 68040 which has more than two million microscopic transistors. A 25Mhz 68040 manages 25 MIPS (millions of instructions per second) when a 25Mhz 68030 does four to five.

The 68040 also has a built-in 68882 maths co-processor (FPU) and even though some Floating Point instructions need to be emulated in the software, it still runs faster than an 68030 and a full 68882. The 25MHz 68040 does 6.5 MFLOPS (millions of floating point operations per second) while a 25Mhz 68882 only manages one-tenth of that.

The 68040 has larger high-speed internal memory caches and improved memory access, but it is also a power greedy and very hot running chip: the main reason there are no A1200 versions.The forthcoming 68060 (the 68050 was dropped) will run much cooler and much faster. When Amiga cards appear using this, prepare for the Doom-type arguments to swing rapidly in the other direction.

CHEAP 040?

White Knight have a limited stock of original Commodore 68040 cards which they have taken as part exchange from customers upgrading to Warp Engines and GVPs. These cards are fully tested and cost £539 each. Contact White Knight for more details.

WHAT
A4000 accelerator £259 without FPU £369 with 50MHz 68882 FPU
WHO
Phase 5
WHERE
White Knight Technology
☎ 0992 714539

CHECKOUT
BLIZZARD

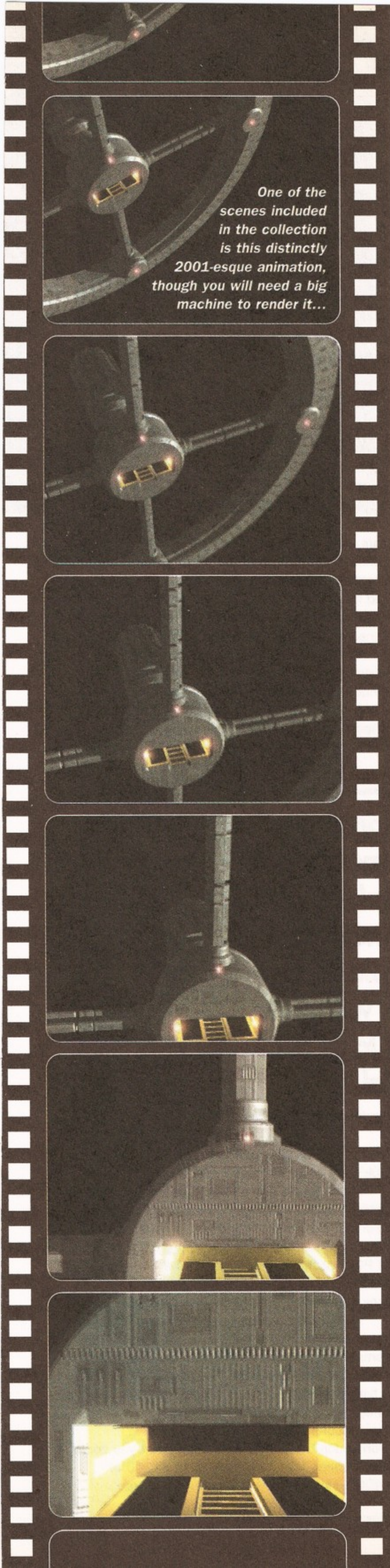
Speed **70%**
Faster than the original card, but no matter how fast the 68030 is, it's no match for a 68040.

Expandability **50%**
A 50Mhz PGA FPU is all that can be added. No memory, or FPUs of different speeds or PLCC fittings.

Documentation **80%**
Short and sweet. A disk of MMU utilities would have been useful.

Value **80%**
For a such a neat card, the price is very reasonable. But think ahead...

Overall rating 75%
The cheapest A4000 accelerator card available but can you afford to settle for this degree of improvement?



One of the scenes included in the collection is this distinctly 2001-esque animation, though you will need a big machine to render it...

The LightWave Collection

Richard Baguley looks at a new set of LightWave add-ons from the 24 bit club.

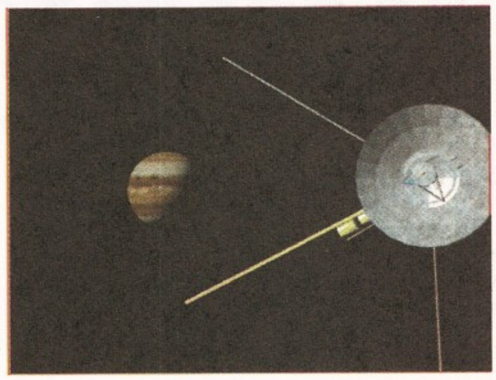
Now that you've read the review of *LightWave* you will no doubt be itching to get into some serious raytracing-type stuff. However, you won't get very far without some objects to work with.

You could, of course, build your own, but one of Craig Collins' (the bloke who produced last month's stunning cover) ten golden rules of raytracing was to use existing objects wherever possible. Fortunately, there are a wide variety of objects out there, and some of the best *LightWave* models available are in this collection.

The 32 objects included in this collection cover a variety of subjects, ranging from Apache helicopters to Jupiter via space shuttles and skeletons. Most of them have been included in the 20 scenes which come as part of the package, so you can quickly see how the objects turn out and how they can be used. Some of these scenes are extremely good, with some excellent examples of how to use *LightWave's* powerful modelling and animation tools.

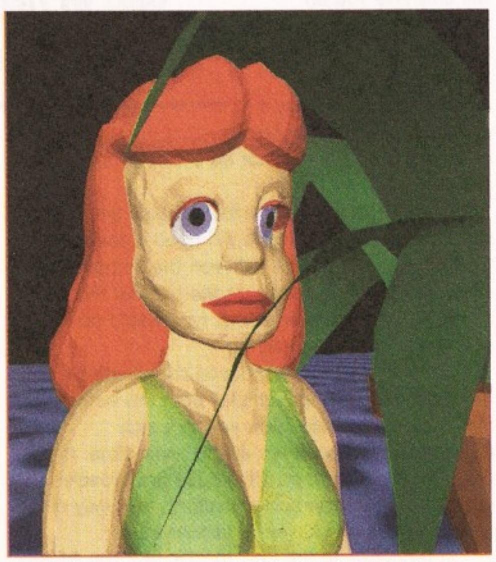
Also included are 63 fonts, ranging from the classic Roman font to the ornate Arabian, and examples of all of the fonts are shown on the single sheet of documentation which accompanies the collection. There really isn't a need for any more than this, as all of the files that form the collection are installed by the installer into the appropriate directories in the 3D directory.

Anyway, enough of the wibble. The images on these pages speak for themselves... AS



Space – The Final Frontier. These are the voyages of the LightWave Collection, it's ongoing mission to boldly go where no raytracer has gone before.

WHAT
The LightWave Collection 1
£29.95
WHO
The 24 bit club
WHERE
The 24 bit club
6 Sirska Square
Floor 1
Glasgow
G23 5DW



Feeling lost and lonely? Why not build yourself a babe? With a little help from LightWave, of course...

CHECKOUT
LightWave Collection 1

Documentation 75%
Only one page, but that's all that is really needed.

Features 80%
A good collection of excellent models, useful fonts and nice textures, although a few more textures would be useful.

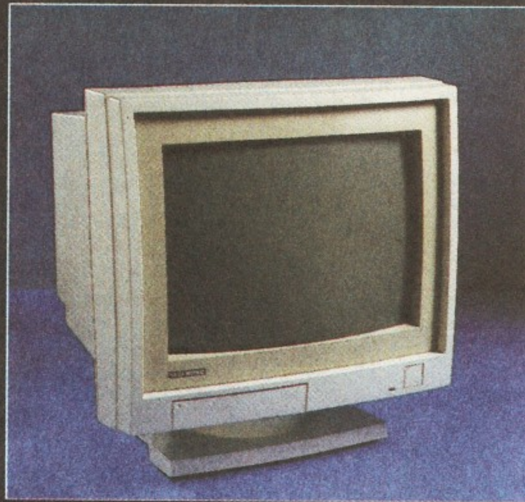
Ease of use 85%
It's all set up to be very easy to use, with most of the objects already having the surfaces set up and a good selection of scenes.

Value for money 75%
It's not cheap, but it is a good collection of some extremely well built LightWave models

Overall 85%
An excellent selection of well chosen models, scenes, fonts and textures. It deserves to do well.

Through the rectangular window...

Richard Baguley looks at the most important part of your Amiga setup – your monitor.



The Microvitec Cubscan 1440 has a very useful feature, called Digital Memory Sizing, where the machine remembers the various settings (vertical size, etc) for different screen modes.

There is one piece of hardware which you will make extensive use of every time you use your Amiga. Whether you are DTP-ing, raytracing, or reading your E-Mail, this bit of kit will be in constant use, and most people tend to forget that it's there. What is it? The monitor.

Whether it's a knackered old portable TV or a state-of-the-art 21 inch monster, it fulfils the same function – showing you what is going on in your Amiga, whether it's your latest E-Mail message or the latest frame from your epic animation of interstellar exploration.

A monitor is like a window – you aren't going to get a good view of the outside world if it's small and covered in all sorts of unpleasant gunge, so you should think carefully before buying and invest in a good cleaner. How much can you afford? Do you need speakers? Should you go for a monitor, or for a monitor and TV combination? What size of screen should you go for? Should you buy a multisync? Life is full of tough decisions, but in this feature we'll try and make it a bit easier.

There are many hundreds of different types of monitors out there, so we have decided to change the rules a little for this Supertest. Instead of reviewing every option, we will be showing you what to look out for, and what the various different types of monitors are capable (or not capable) of.

The cheapest (and least flexible) option for buying a monitor is to get a single sync monitor such as the Philips CM 8833 Mk II or Commodore's own 1084S monitor. Although these are not as popular as they once were, you can still pick them up relatively cheaply or second-hand. As you may have guessed from the name, this type of monitor is only capable of displaying signals at one frequency, which will usually be at around 15.5 kHz, as this is the frequency output by a standard Amiga A500.

However, more recent Amigas have several new features in terms of graphics modes, including the likes of super-high resolution and DoublePal. These new modes give you more pixels on the screen, but they do it by outputting a signal with a higher frequency, which means that a single scan monitor will be unable to display the signal, and will only give you an unintelligible mess. However, both the Philips and the Commodore model can also display a composite signal, so you could also use the monitor as a display for a video or camcorder.

> **"If you are planning on investing some money in an expensive graphics card, then it's definitely worth spending the extra on a monitor which will allow you to use it to its full potential."**



A big monitor (such as this Idek MF-8617) could be essential if you are planning to work in high resolution a lot.

The Philips model can also display S-Video style signals, although you will need a special lead for this. You can switch between the computer and other source via a button on the back of the machine, so a monitor of this type would be suitable if you need that.

Several companies produce combination monitor TVs which can display both the output from your Amiga and allow you to watch Eastenders, although not at the same time. In terms of the picture quality, these are broadly similar to the single scan monitors, and may of them use the same type of picture tube.

In response to the new modes that the A1200 and A4000 can display, Commodore decided to bring out two new monitors: The 1940 and 1942. These two monitors are dual syncs, which means that they can display signals at two frequencies (around 15kHz and 31kHz). This means that these monitors can happily cope with signals in both the old modes and the new super-high resolution and DoublePal modes, although any video signal with other frequencies can't be displayed.

Multisync monitors can, as the name rather suggests, display signals at a range of frequencies. Exactly what frequencies these are varies from monitor to monitor, so you should check the exact specifications before you purchase a monitor. If you are planning to use it with an AGA machine, then it needs to be able to cope with vertical frequencies of between 15.5 and 31kHz.

If you are planning to use it with a 24-bit graphics card, you should check the specifications of the card, as some of them (such as the GVP EGS Spectrum or the Retina III) can output a higher resolution image at a higher frequency if your monitor can cope with it. The Spectrum card can give you an image with a resolution of up to 1600 by 1280, although you will need a monitor which can cope with signals of up to 90kHz to be able to cope with this.

Many people are attracted by the prospect of getting hold of a cheap VGA monitor designed for use with a PC and using this with their Amiga. After all, given the quite unnervingly large number of PCs out there, these monitors are a significant amount cheaper than most Amiga monitors, and they can work with the new AGA Amigas.

VGA monitors are designed to only be able to cope with one horizontal frequency, as the common or garden PC VGA card can only output signals of around 30kHz. The frequency output by a typical Amiga is around 15kHz, but it is possible to up this to around 30kHz by using one of the new DoublePal screenmodes included in Workbench 3 and above, meaning that you could use a cheap VGA monitor with an A1200 or A4000. However, there are several severe

SIGNALLING THE CHANGES

The video signal output by your Amiga is an RGB signal, which means that it is split into three parts for the red, green and blue parts of the image. This differs from the signals produced by most video recorders, so you can't expect to be able to play back your videos through most of the monitors mentioned in this article, although some of them will have the capability to do this.

Accompanying the RGB signals are two more : the Horizontal and Vertical sync signals. These two signals control where the monitors electron guns point.

The horizontal one (as you might expect) controls the horizontal position – it tells the monitor when to skip back to the start of the next line. The vertical sync tells the monitor when to skip back to the top of the screen.

limitations that you should be aware of.

For instance, you won't be able to play any games on your Amiga which boot up from a floppy disk. As the Amiga boots by default into a screenmode which runs at 15kHz, all you will get with a game like this is an unintelligible mess, which would be quite difficult to play. The same goes for any program which you boot from floppy disk.

Another part of the improvements for Workbench 3 is mode promotion, where any screen which attempts to open a screen which would output at 15kHz will be forced to use a higher resolution screen. However, this only has limited success, as it only works with programs which open a screen legally.

Some serious programs are still somewhat naughty about how they open screens, which means they may not work with a VGA monitor. It's also impossible to use a Genlock with the DoublePal screenmodes, as most genlocks can't cope with the horizontal frequency of the signal.

If you are lucky enough to own an A3000, then you won't have these problems, as the 3000 has a built-in flicker fixer which doubles the frequency without any need for software, so it can quite happily display games and the like on a VGA monitor.

SIZE IS IMPORTANT

Despite what some people may say, size does make a difference, especially when it comes to monitors. Although a 14 inch monitor may be all right for playing games and general fiddling around, you'll really need a bigger monitor if you are planning to do any serious DTP or ray tracing. Although moving up from a 14 to a 15 inch monitor may not sound that much, it gives you an extra 30 per cent of screen area.

It's especially important that you get the biggest monitor that you can afford if you are planning to do a lot of work in high resolution. Running a DTP program such as Pro Page or PageStream in high resolution mode means that you can get more onto the screen, but if you are working on a small monitor, you will have problems reading the screen. Realistically speaking, the maximum resolution you could work with on a 14 inch monitor (such as the Philips CM8833) is around 640 by 512. You can go higher than that, but you stand a good chance of driving yourself blind.

When you start looking at 17 inch monitors (such as the Idek MF-8617), you can usually work with a resolution of up to 1024 by 760, and a 21 inch monster should allow you to work at resolution of up to 1600 by 1280, which is the maximum you are likely to ever be able to get.

> **"Despite what some people may say, size does make a difference – especially when it comes to monitors."**

All of this means that if you are planning to do a lot of high res DTP work, or invest in a high spec 24-bit graphics card, you would be very well advised to also consider investing in a large monitor.

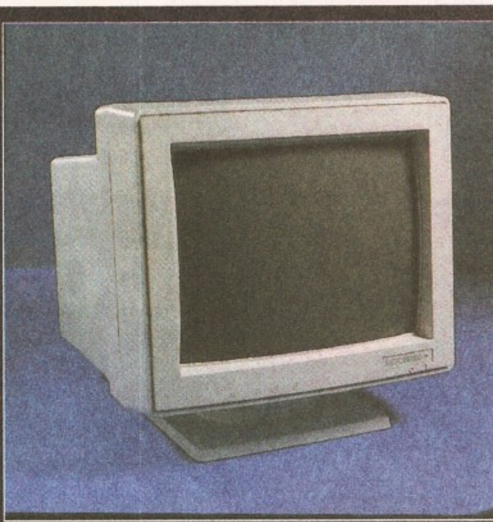
INTERLACED IN HEAVEN

Many of the Amigas high resolution screenmodes use a process called interlacing, where the vertical resolution is doubled by diving the screen into two parts. The two parts are sent in alternate video frames, and the fact that the phosphor dots on a monitor take a short amount of time to fade gives the impression of a single image. This is the way that TV images are transmitted, and the ability to send a video signal in this fashion has always been one of the things that as made the Amiga popular in video circles. However, there is a downside to this: interlaced screen modes flicker, and extended use can cause eye strain and eventual death.

There are two ways of getting around this irritating flicker: using the DblPAL screenmode or getting hold of a flicker flixer. The DblPAL screenmode works by doubling the vertical frequency, so the entire frame is transmitted in one go. Although this works fine with Workbench or any program which uses the workbench display database, it won't work with any badly written software or games, as these don't open their screens through the operating system. If you want to play games on a monitor which can't cope with a 15kHz signal, you'll need to invest in some extra hardware.

A flicker fixer is a device which doubles the frequency of the signal without altering the resolution of the screen. This means that you can both use interlaced screens without driving yourself blind and play games on a monitor which can't cope with the normal Amiga screenmodes. there are a variety of Flicker fixers available for the A500 and A2000, and these should be available from some dealers. A3000 owners already have a flicker fixer, as this was built into the machine by Commodore. Unfortunately, there are no models suitable for the A1200 and A4000. Commodore were working on their own design, but this was shelved (along with a lot of other things) when Commodore international went into liquidation.

Choosing a monitor is rather like buying a car – if you buy a mini, don't be surprised when it can't tow your caravan. Before buying, you should decide what you are planning to do with it, and how it will fit into your Amiga setup. If you are planning on investing some money in an expensive graphics card, then it's definitely worth spending the extra on a monitor which will allow you to use it to its full potential. AS



One of the most popular multisyncs in the Amiga world has been the Microvitec 1438 which can easily cope with all the Amiga screenmodes.

JARGON BUSTING

Vertical Sync – the frequency of the vertical synchronisation pulse produced by the computer. This signal tells the computer when to move the electron gun back to the top of the screen. What it basically boils down to is the number of frames per second displayed on the monitor.

Horizontal Sync – the frequency of the horizontal synchronisation pulse which tells the monitor to skip back to the left hand side of the screen to begin a new scanline.

Multisync – a monitor capable of displaying video signals with a range of frequencies.

DualSync – a monitor capable of displaying a video signal at two different frequencies (such as the Commodore 1942, which can display signals at 15 and 31 kHz).

Single Sync – a monitor which can only display signals at one frequency (such as the Philips 8833 Mk II, which can only display signals with a horizontal Sync of 15kHz)

Dot Pitch – the size of the phosphor dots on the picture tube which form the image. The smaller the dots, the better the quality of the image, especially at high resolutions.

Composite – a type of video signal where all of the video information is combined into a single signal. As expected, this means the quality is lower than both S-Video and RGB.

S- Video – a type of video signal used on SVHS and Hi-8 video recorders. The video signal is transmitted as two parts (chrominance and luminance).

RGB – a type of video signal where the image is separated into three separate signals for the red, green and blue parts of the image. In fact, each of these signals is basically a composite signal.

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Your favourite magazines come to life...



The World of Amiga

Welcome to The World of Amiga – a whole show in itself, this is the place where you'll be able to see everything that's new and exciting for the Amiga, still Britain's liveliest home computer. Developments in CD-ROM, FMV, graphics, games and more will be there for you to see and try, and you can buy the biggest Amiga bargains too!



Amiga Theatre

The Amiga Theatre will be the focus for all things Amiga: run by Amiga Format editor Steve Jarratt, with contributions from the eds of Amiga Power and Amiga Shopper. It will be the place where you can meet and quiz the experts such as magazine writers, software developers, technical gurus, and the people who are deciding the future of the Amiga. You'll be able to learn, take part, ask questions - get involved!



The Future Music Feature

Come to The Future Music Feature – discover the amazing world of modern music, and find out how you can make music for yourself without having to spend a fortune or take years learning to play. Music is one of the most exciting areas of computer use, but so few people get involved: we can show you how! And if you're a musician already, we'll have all the most exciting new kit lined up for you to try, and lots of experts on hand to help you explore new ideas!



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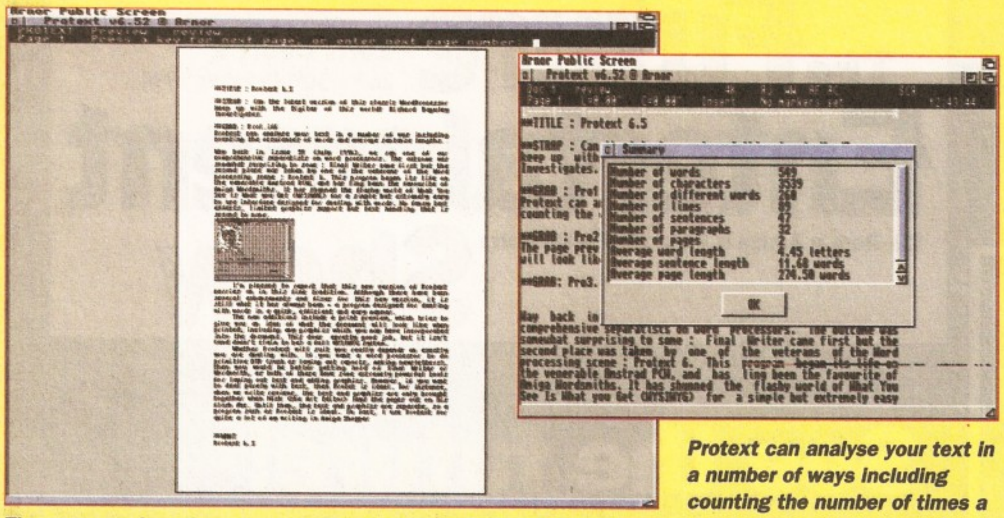
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The page preview gives you a pretty good idea of what the page will look like when you want to print it out. It's quick as well.

Protext can analyse your text in a number of ways including counting the number of times a word appears and calculating the average sentence length .

Protext 6.5

This word processor became a classic. Richard Baguley finds out if the reputation holds good

Way back in issue 39 (July 1994), we ran one of our comprehensive separatists on word processors. The outcome astonished some of you. Final Writer came first (no surprises there) but the second place was taken by one of the veterans of the word processing scene: Protext 6.

This program began life on the venerable Amstrad PCW, and has long been the favourite of Amiga wordsmiths. It has shunned the flashy world of What You See Is What you Get (WYSIWYG) for a simple but extremely easy-to-use interface designed for dealing with words. No fancy text effects, limited graphics support but text handling that is second to none.

I'm pleased to report that this new version of Protext carries on in this fine tradition despite the addition of several enhancements and fixes.

The new additions include a print preview, which is intended to give you an idea of what the document will look like when printed including any graphics which you may have incorporated into the document. This does a pretty good job, but it isn't (and doesn't claim to be) a full WYSIWYG system.

There is an auto-correct function, which when enabled tries to correct any errors you make as you type. When you finish typing a word you press space and Protext looks for that word in a directory of common mistakes. If it finds it, it corrects the word, automatically .

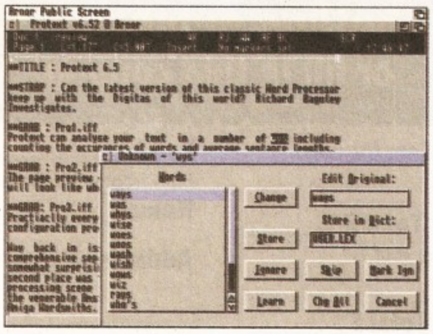
Protext 6.5 can also deal with capitalisation ,so if you forget to put a capital letter at the start of a sentence, it corrects that, too. The words it tries to correct are held in a special dictionary, which can be edited from within the program. Fortunately, both of these can be turned on or off as you wish in the configuration program, as they can be more trouble than they are worth. However, most of the time they are extremely useful and are best left on. You can also choose to have words spell checked as you type, but, again, this is down to individual preference.

The graphics handling has also been improved, and it is possible to view a graphics file you want to incorporate into a document, even if it only appears in the body of the text as a command line.

CONFIGURE IT OUT

One area in which Protext has always been extremely strong is configurability, thanks to both its ability to record macros (a series of key presses which can be replayed on demand) and its own programming language. The combination of these means that Protext can automatically do more or less any task which involves processing text – as long as you can write the necessary program.

You can also issue any of these commands through the programs ARexx port, so you could easily write an ARexx program to carry out your task. Only a couple of small changes have been made to this version – the result of the addition of a few new commands.



The Protext spell checker contains 110,000 words. However, you can get shorter checkers which speed up the process.

My only real gripe with Protext is its non standard printer drivers. Although it comes with an extremely good selection of drivers (more than 150) it does not use the workbench printer driver, but instead talks directly to the printer. I really can't see why this is. This is not only a bit naughty in programming terms, but it also means that if you have a printer on a network or an unusual printer, you are not going to be able to use it.

Protext also has extremely good support for converting text into other formats, thanks to its Convert program. This can read in various formats (including Rich Text Format and Wordstar). Support for some of the popular PC word processors such as Ami Pro or Microsoft Word would have been nice, but most word processors should be able to read either straight ASCII text or Rich Text Format without any problems.

There are also certain other quirks of the program, such as the fact that you can't go from the start of one line to the end of the previous one by moving the cursor backwards. If you try this it just sticks against the start of the line in a most irritating fashion. Still, this is the sort of thing that you would get used to pretty quickly, so I don't think it's a real problem.

Whether Protext will suit you really depends on exactly what you want to do with it. If you want a word processor to do primitive DTP (such as laying out reports, making newsletters, etcetera), then get hold of Final Writer or Workhorse, because both of these have extremely powerful tools for laying out text and adding graphics.

THE SHOPPER CHOICE

If you want to deal purely with large amounts of text, however, then Protext is ideal. For instance, when we write reviews such as this, the text and graphics are only brought together when Nick (the Art Editor) lays the pages out on his flash Mac. Until then, the text and graphics are separate, so a program such as Protext is just the job. In fact, I use Protext for quite a lot of my writing in Amiga Shopper, including compiling this review.

Need I say more? AS

WHAT
Protext 6.5
35.25 (Upgrade from Version 6)
47.00 (5.5)
65.32 (4.3 or below) 99
WHO
Arnor
WHERE
Arnor ☎ 0733 68909

CHECKOUT
PROTEXT 6.5

Documentation 80%
Two manuals give you the full lowdown on the program and provide all the details you should need on the command language.

Ease of Use 90%
By and large, it's extremely easy to get into, although it does have its quirks.

Features 93%
Practically every text manipulation tool you are likely to need, plus macros and a built-in programming language. What more could you need?

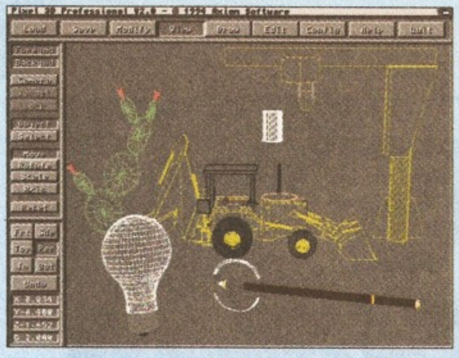
Price 90%
It's comparable with both Final Writer and Wordworth, but I think it's better at dealing with text alone than either.

Overall 93%
If you want text effects, fancy layouts and graphics, go for Final Writer or Workhorse. If you are dealing only with text, go for

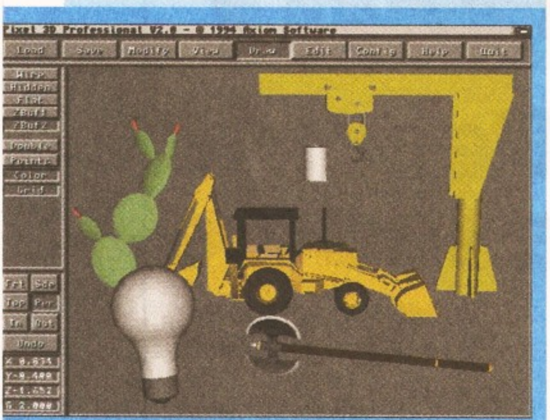
AMIGA SHOPPER BEST BUY

Pixel3D-Pro V2

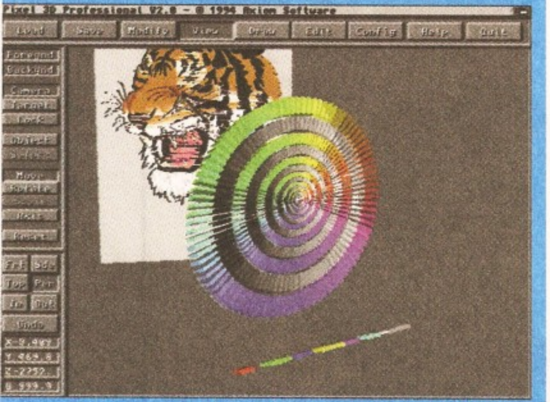
R Shamms Mortier looks at a software that can do much more than just convert formats.



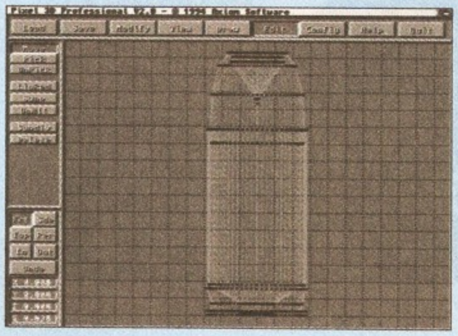
For editing purposes it's nice to be able to select "Wireframe" or "Hidden" for object preview. This allows you to move around the screen faster, even when "color" is toggled on. Redraw in Wireframe modes is very fast.



For a clearer view of how an object's surface will appear you can use the Flat preview.



One of the most spectacular features that this software contains is the ability to import and manipulate PostScript vector graphics files, and to add 3D depth to them if needed. I don't know of any other software that does this as well.



Pixel3D-Pro V2 provides complete editing tools that have some of the feel of working in LightWave's modeler screen.

This software comes under the general title "3D object file conversion" software. It means that it can take in one 3D object file format and save it out to a different one. As for what formats it reads and writes, let's detail that first before we go on to the more intricate stuff.

It can import nineteen different 3D object file types: 3D Pro, 3D Studio ASCII and Binary, AutoCAD DXF, IFF Bitmaps, Caligari, Draw 4D and Pro, Imagine, LightWave Objects and Scenes, PostScript ASCII and EPS, Scenery Animator DEMs, Sculpt 3D and 4D, Turbo Silver, VideoScape ASCII and Binary, VistaPro DEMs, and Wavefront. It can output to sixteen formats: LightWave Object and Scene, Imagine, Turbo Silver, Sculpt 3D/4D, Caligari, Draw 4D/Pro, Aladdin, 3D Pro, DXF AutoCAD, 3D Studio, Wavefront, VideoScape ASCII and Binary, and Digital Arts. The 3D format for Real-3D is conspicuously absent, though the DXF file read-writes should satisfy R3D owners.

This software can do much more than just convert objects from one format to another. For instance, it has some of the fastest drawing routines around. To enhance this capacity, *P3DP2* allows you to render your objects in a variety of modes: Wireframe, "Hidden" Wireframe, Flat (filled shaded polys), and ZBuffer. Color, of course, responds to the type of Amiga you have. If you have an AGA machine, objects are rendered in 256 colours or shades of gray. You can also "double" the polygons contained in an object, while "points" shows all editable vertices. "Grid" toggles a wireframe only grid display (like the ground grid in *LightWave*, *Caligari*, and *Aladdin 4D*).

Most rendering/animation packages offer loads of editing tools so that objects can be altered almost infinitely. *P3DP2* gives you a selection of basic editing tools, such as Smooth, Extrude, and Bevel. By far the most complex of these three is the Smoothing option. You can play with the Detail/Segment/and Horizontal-Vertical Elimination numerical input. Extrusion is used for Bitmaps or Bitmap fonts. Never use it on a 3D object, unless you need to render an example of utter chaos.

Bevel is an operation meant for fonts, giving 3D fonts and logos that nice professional bevelled edge look. Unique to *P3DP* is the ability to apply "router bit" edges, constructed from saved out graphic "bits" that you design yourself.

PAINT YOUR POLYGON

3D Polygon Painting is one of the newest buzz items to hit the market, offered by such high end packages as Caligari Corporation's *TrueSpace*. After selecting polygons for painting, you turn them to whatever color is available. *P3DP2's* 3D painting process is addressed by a 3D Painting Requester. The same requester allows you to see which coloured polys are "smoothed"

Most users will no doubt use this software to manipulate and extrude text strings and bitmap logos, and *P3DP2* can work with either Postscript or Amiga Bitmap fonts. *P3DP2* assumes that your Bitmapped fonts are in a drawer called "Fonts", and you cannot change the path of the drawer name (except by a complicated series of assign statements in the CLI). This should be altered.

You need extruding, especially if part of your Amiga work involves producing animations of client's logos. Extrusion gives depth to flat graphics. It took me about thirty seconds to create a simple 16 colour graphic in *DPaint*, import it into *P3DP2*, and develop an extruded 3D object from it. If I would have wanted to smooth out all of the jaggies, that would have added another few minutes to the whole process. *P3DP2* extrudes objects much faster than any of the 3D packages that I use to accomplish the same thing.

The manual needs to have some visuals that depict what happens when the Smoothing operator is used on a bitmap. This would be better than pages of words. The software is very visual, and the docs should follow suit. I think all docs should have an index, especially when the program is as detailed and complex as this is.

LightWave is the mother of all utilities at this point, and the look of *3DP2's* interface proves that out even more. It looks and feels like you're operating in the *LightWave* environment, right down to the 3D grid and object/camera moves. Every step was taken to take advantage of this look and to identify the program with NewTek, one of the few Amiga winners of all time.

The software requires Workbench 2.x or 3.0 and an accelerator with a maths co-processor. AS

WHAT
Pixel3D-Pro 2.0
MSLP $299.99 (approx £200); $125.00 (approx £85); from earlier versions.
WHO
Axiom Software
WHERE
Axiom Software, 1668 East Cliff Road, Burnsville, MN 55337
☎ 0101 612 894-0596

CHECKOUT
PIXEL3D-PRO V2

Features 95%
Just try and even *find* this kind of package on other platforms.

Documentation 85%
Tutorial graphics or a tutorial video are needed.

Ease of use 90%
More study is obviously required for advanced applications. Helpful technical services are available if you get stuck however.

Value for money 95%

Overall rating 92%
An excellent 3D file converter with some very powerfull modelling tools.

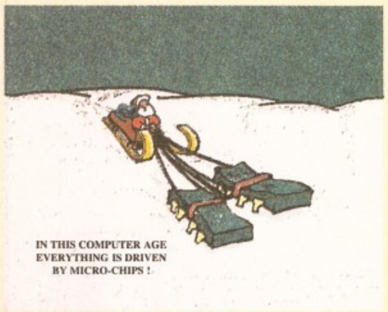
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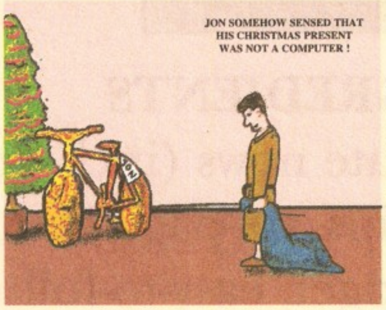
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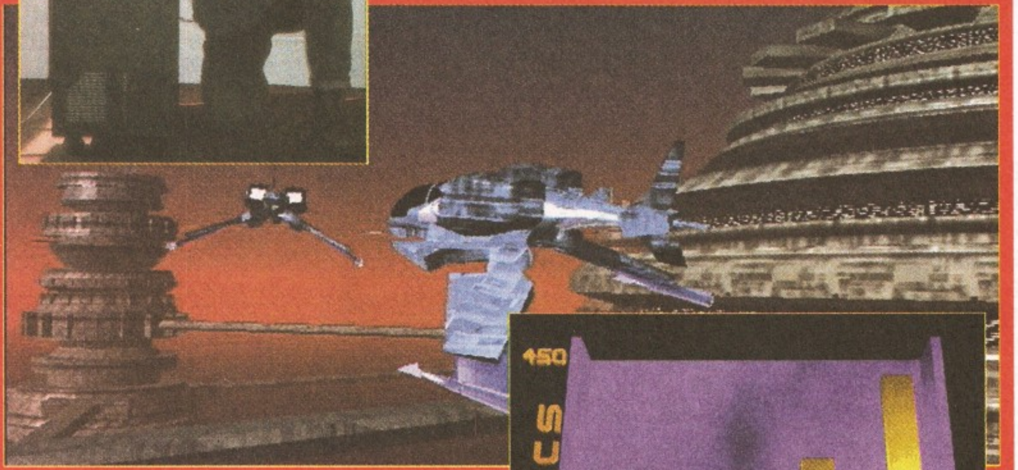
The RAPTOR

Graeme Sandiford is stunned by the hottest piece of Amiga hardware on the planet – the Raptor Plus.

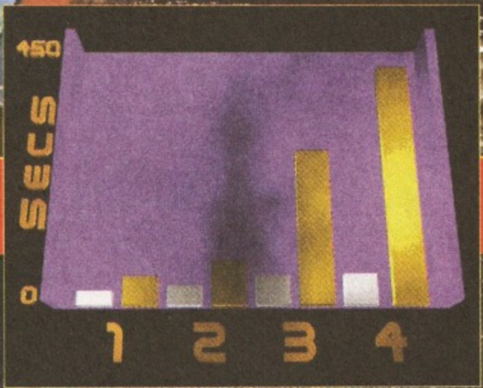




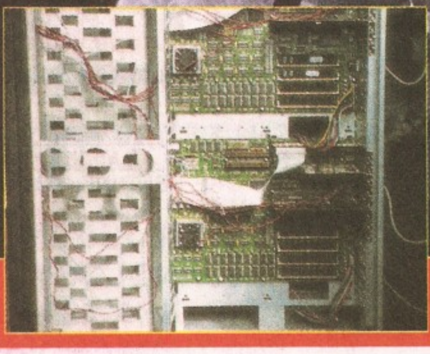
Above: A frame from the stunning intro to Alien Breed – Tower Assault.
Left: John Allardice cuddles his pet Raptor.



Above: Another still from the intro.
Right: A (lightwave generated) graph showing the relative performance of the Raptor.







Above: Another still from the Alien Breed intro.
Left: It's a big case, but there are only two boards...

Without a doubt, the Raptor Plus can be described as the hottest piece of Amiga hardware on the planet. It's also aptly named as the Latin word raptor literally means ravisher or plunderer and is often used to describe predatorial animals or birds (like the Velociraptors in *Jurassic Park*). That is exactly what the Raptor does, it preys on *LightWave* scene files, mercilessly eating vast numbers of them for breakfast.

If you don't already know, the Raptor is an immensely powerful RISC-based rendering engine. It's used in conjunction with an Amiga and LightWave to render 3D animations. With a £14,500 price-tag, it is strictly for professional use only. The justification for this seemingly high price, is the Raptor's almost ludicrous speed. There have been rendering speeds reported of around 40 to 50 times faster than those performed by a standard A4000/040. One company rendered a frame, on a A4000 running at 25MHz with 18Mb of memory, which took in excess of 64 hours to complete. The Raptor needed only 41 minutes to render the same frame!

With speed like that, it's little wonder that the Raptor has found a home with companies such as Amblin Imaging. However, while it has been kicking serious butt Stateside, it has not been unleashed on Europe. That is, until Team 17 bought theirs.

At the Autumn ECTS one of the main subjects for bar-room discussion was the Team 17 stand. Aside from the usually high number of quality games the focus of attention, for most of the show's attendees, was the promotional video for Tower Assault. Tower Assault is Team 17's next release – due out in November. The game is up to Team 17's usual high standards, but the intro-sequence looks set to surpass anything they, or anybody else, have produced so far.

THE ODD-ONE-OUT

Most of the onlookers assumed that the intro had been created on high-end graphics station such as a Silicon Graphics (SG) machine. This is because most game houses have turned to SG machines to produce 3D-generated sequences. A chief example of this is the intro and mid-game sequences found in Psygnosis' Microcosm.

One of the reasons that most companies have opted for SG machines is not because the Amiga cannot produce results of equal quality. Rather, the deciding factor has been speed – RISC-based SG machines leave the Amiga choking on their dust. Of course, this kind of speed is not produced without cost. *Amiga Shopper* went up to Team 17's Yorkshire offices to determine if they have found an alternative to SG machines, or an expensive beer-cooler.

FIRST IMPRESSIONS

After arriving at Team 17's office I was left in the capable hands of LightWave-supremo John Allardice. To make use of the Raptor's awesome power you need a pretty "butch" machine. John uses an un-accelerated A4000 '040 with a total of 18Mb of RAM. If anyone were in need of a A4000T it has to be John, his machine is absolute stuffed to capacity.

The Raptor's appearance was surprising for two reasons. Firstly, the unit was actually larger than I expected – it's about the same size as a small fridge. However, the boards themselves are surprisingly small and the casing has plenty of room for expansion. In fact, with the huge fan at the rear of the unit, you could keep several cans of

beer cool inside.

The unit has two CPUs – one on each board. The only connection between these boards is an ethernet cable. The same cable that runs between the two boards also connects the Raptor to the Amiga. As you would expect, the boards are festooned with chips and sockets. The main CPUs, MIPS R4600 each running at 133MHz, closely resemble Chips like Intel's Pentium. They appear rather chunky as they are covered by a heat-sink and then by a fan. Chips that are running at the speed of the Raptor's CPUs are going to generate a lot of heat, and if it weren't for the heat-sinks and fans they would probably melt within a few minutes of being turned on.

THE NITTY-GRITTY

So, why is the Raptor so fast? You will probably have noticed that the MIPS R4600 doesn't sound as if it is part of Motorola's 680XX family of processors. In fact it is RISC (Reduced Instruction Set Code) Chip. This processor is actually a 64-bit chip, unlike the 680XX processors which are only 16 or 32-bit. To give you some idea of the difference in performance, you could compare a A500 or even a C64 to a A4000.

If a machine has a 64-bit architecture then it can move information in 64-bit chunks rather than 16 or 32. The R4600 has a FPU (Floating Point Unit) built into it. An FPU helps to speed up floating point calculations such as those generated by ray-tracing programs. Anybody who has used both an integer and FPU version of a program can easily relate to how much more important an FPU is to a rendering engine like the Raptor.

But how does the Raptor's processor measure up to a SG machine's? The Indy is the most popular SG machine. It uses an older member of the MIPS family – the R4000 processor. As with the R4600, this is a 64-bit RISC-based chip, but runs at a slower clock speed of 100MHz. As well as having a faster processor, the Raptor has two of them. They can be utilised together or individually, this means the can be both assigned to the same task or be devoted to different users or tasks.

When it comes to storage of data, both systems use super-fast SCSI 2 devices. In the memory department both machines can take up to a maximum of 256Mb. However, the Indy uses 32-bit (just like the A1200 or A4000) while the Raptor makes use of 36-bit memory modules. Team 17's Raptor is fitted with a total 128Mb – a more than respectable amount. This amount of memory should mean that the Raptor should have no difficulty in rendering any scene file you can throw at it. In fact, the first limitation on the size of scene that can rendered is the size of the A4000's available memory. Not only does the Amiga have to generate the scene file, it also has to transfer and receive the files and images.

THE NEED FOR SPEED

From these specifications you can get some idea of why the Raptor is as fast as it is. But to gain some figures you can relate to, and get an idea of how good the Raptor is at its job, we performed some benchmarks. The benchmarks were all LightWave renders – after all that's what the Raptor is used for. The scenes vary in complexity to give an overall view of the Raptor's performance with simple and more complicated tasks. The bar chart entitled 'Benchmarks' puts the Raptor's rendering speed against a standard A4000/040.

In view of the incredible results that we have got, the benchmarks we've used for the chart are not too complicated. The more complicated a scene is, the greater the difference between the performances. With the more complicated scenes there is no way that we could provide an accurate yet readable scale.

Benchmark number 1 was a relatively straightforward render of the male Humanoid object from Crestline. It was rendered at a low resolution (320 by 240 pixels) with no motion blur or anti-aliasing. The Raptor rendered the first frame in 24 seconds, while the A4000 took 48. This result is a little surprising as the Raptor only completed the frame twice as quickly.

Benchmark 2 was performed at medium resolution, with no anti-aliasing or motion blur. While the A4000 took 73 secs, the Raptor only needed an extra 9secs than it did for the previous scene – completing the render in 33 secs.

Benchmark 3 also performed at medium resolution, but this time motion blur and anti-aliasing were both turned on. This increased the A4000 rendering time by a factor of more than 3.5, producing an image in 269 secs. The Raptor produced the same image in 49 secs.

Benchmark 4 is where the Raptor started to pull away. This was a medium resolution render of three trucks with anti-aliasing switched on. This only took 52 secs on the Raptor, but the A4000 took 435. It would seem from these figures that the Raptor's extra speed really starts to tell the more complicated the scene becomes. After these first four tests they are starting to go off the scale, one rendering of a Harley Davidson took 100 secs on the Raptor and 858 for the A4000. After that things started to get silly.

HOW DOES IT WORK?

Well, now we know how fast the Raptor is and why, but how do we use it and do we need any other hardware? As mentioned before, the two boards that comprise the Raptor are connected by an ethernet cable. The Raptor is attached to the Amiga in the same way, so you'll need an ethernet card.

You can control the Raptor by using the ScreamerNet software supplied with the Raptor. ScreamerNet is a rendering network, from NewTek, that can utilise up to a maximum of eight CPUs. Once the ScreamerNet has been activated the Raptor is controlled through *LightWave*. Version 3.5 of *LightWave* has a special ScreamerNet menu with a variety of options. After the ScreamerNet has been initiated, *LightWave* will search for CPUs. Once a CPU has been found by *LightWave* it will be added to the CPU Status window. This is a list of available CPUs and their current status.

Object, Image and complete scene files can all be sent to the Raptor, which will set upon them with glee. There are three ways in which the Raptor's CPUs can render a scene. In the Manual and Automatic modes both of the Raptor's processors will work on a portion of the same image. When in automatic mode they will move on to to the next frame, but only when all of the processors have completed their section. In Independent mode each processor works on its own frame. This can be quicker as the processors don't have to wait around for each other – they can go straight on to the next frame.

That's basically the process – you define the scene file, build the objects and then send their details over to the Raptor. The Raptor then chews through the scene in a ridiculously quick time and then, almost contemptuously, passes the rendered images back to the Amiga.

JOHNS PET RAPTOR

John Allardice is a very talented man, not only that he's a very lucky one too. He has access to Europe's first captive Raptor. John has used a variety of the 3D programs available on the Silicon Graphics (SG) platform. He prefers using *LightWave*, but has struggled a bit with the slowness of the Amiga. I asked John why Team 17 decided to buy a Raptor and how well it was living up to his expectations.

"We had a look at all the Silicon Graphics stuff, but we also had a chat with Raptor-users in the States. On comparing the rendering speeds we thought the Raptor could be a viable alternative. In the end, buying a Silicon Graphics setup that could achieve the same speeds as the Raptor would have cost us over £100,000 plus software. Basically, I couldn't think of a better tool I could use.

When the Raptor first arrived I was a little disappointed with the differences in speed between the A4000 and the Raptor. I'd tried some low res renders; I did a test render in Super low res – it took 30 seconds; I did at low res – it took 30 seconds; I did at medium res, it took 31 seconds; I did it in medium resolution with motion blur – 32 seconds.

Then I decided to give the scenes more light sources, more polygons and more lens flares. It just gobbled it up, it seemed that the more work you gave it the harder it worked. Its extra speed really showed when things like anti-aliasing and motion blur are applied. This was just what we wanted.

The ECTS was great, we people who worked on SGIs coming up to asking us if we were using SoftImage or Alias. When we told them we used an Amiga, they would smugly asks us, 'how long did that take to render, then?'. When we told them, all you could hear was the sound of jaws hitting the ground. So, yes you could say I'm quite pleased with its performance."

WHERE TO GET IT?

The Raptor – approx. £14,500
Ramiga International ☎ 0690 770304

IS IT WORTH £14,500?

Well you've heard the facts, you know what it can do and how its hardware measures up to the competition's. But is it worth that much money? Well, as a similar SG setup is going to cost you around £100,000+ with software, It actually seems to be a cheap option. This is still the case when you add the price of the A4000 (about £2,500) and the price of *LightWave* (£550–£650).

But can the Raptor and *LightWave* combination really produce results to rival those of SG machines and software? After seeing some the animations that John has produced I have no doubts that it can. If you want to know what John thinks of Raptor, then take a look at the boxout. If you want to find out how good *LightWave* is, take a look at our 5-page review of version 3.5 which starts on page 17 of this issue. On a price versus performance match-up the Raptor is streaks ahead of the current competition. Although its price puts it out of reach of keen amateurs it does give small games and graphics companies the chance to get SG-like performances at an affordable price. AS

Window Shopper

In this month's Window Shopper Graeme Sandiford takes a look at two juicy CD-ROMs and Mark Smiddy checks out a new hard drive.

CD-ROMs have really taken off recently and in this month's *Window Shopper* we're taking a look at two of the best. We are also reviewing the latest addition to the BSB family of books and a new 130Mb PCMCIA hard drive from Zappo.

AMINET SHARE 3

You will probably know this already, but the Internet is an incredible large network of computers and it's getting bigger all the time. Thankfully, a portion of Net (about 1.5Gb), called the AmiNet, is dedicated to lovers of the Amiga. It's a great place to pick up the latest in PD and shareware software.

The AmiNet CD-ROM is like a slice of the Net that you can explore without a modem or having to pay a phone bill the size of a small country's GNP (Gross National Product). The disc contains



Hmm... this mad cow disease has really mutated over the last couple of years – yuck!

software, pictures, music modules and developer's tools by the bucket-load. Of course, the only thing that you don't get is contact with other Amiga-users. However, advice and information is readily available in the form of text files and AmigaGuides.

If you have been on the AmiNet before one thing you will find comforting about the disc is that it is structured in the same way as the AmiNet. This great if you frequent the AmiNet regularly but have not downloaded certain files because of the time they would take. You simply following the same directories as you would if you were on-line and then copy them to disk without paying a sausage.

As I've mentioned before, the disc contains several text and AmigaGuide files. Some of these contain some very interesting and useful information. One of the most practical of these is the AmiNet directory.It can be de-archived to RAM without leaving the guide document. All you have to do is double-click on the file's button – you can even read a brief description before you do so.

As with previous versions of the collection there are plenty of picture files. There are directories dedicated to ray-traced images, icons, and Workbench backdrops. While there are some outstanding examples of Amiga art, I'd have to admit that there is not as wide a selection as the first edition of the disc. However, there are some particularly surreal Imagine-produced images by Bill Graham.These images will also be featured on the cover disc of the next issue of Amiga CD32.

As you might expect there are plenty of comms-related programs on this disc. There are tools and guides for the Internet, Fidonet and a variety of news networks. The Internet section was pretty good and contains almost everything you need to get wired into the Net.

There are plenty of graphics programs and files as well. You can find spline-editors, picture converters, animation tools, fractal generators and 3D objects. There's an AGA-section for those of us lucky enough to have 1200s or 4000s. The AGA software includes a variety of useful tools such as monitor drivers and a graphical–Workbench hacks.

There is also a nice juicy utilities section with all manner of useful programs. There are archiving programs, boot utilities, virus checkers, screen-savers, ARexx scripts and file compressors aplenty.

If demos and slideshows are more to your liking then you'll have a great time in the demo directory. There is a wide selection of demos and slideshows from artists and coders from all over the globe.

There is loads of other stuff too – the disc is literally full of some of the best Amiga PD software and images around. In my opinion this is probably the best PD CD-ROM around at the moment. The only disc I liked better was the first AmiNet volume.

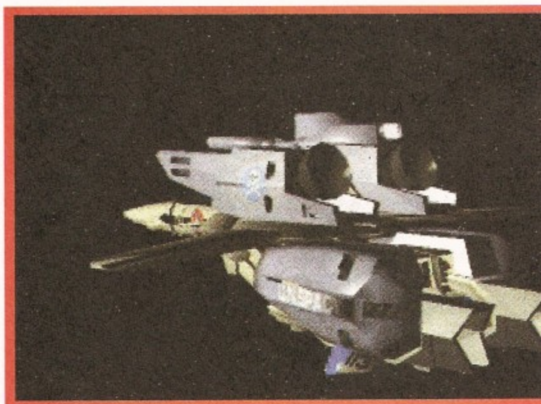
Product: AmiNet Share 3
Price: £19.99
Supplier: 17Bit Software
Tel: 0924 366982

Overall Rating: 92%

CD EXCHANGE VOLUME 1

Now this is an interesting disc – not only does it claim to be, like most PD CD-ROMs, the ultimate shareware collection, it also has extensive support for transferring files. This is not limited to transferring files between different Amigas, as it has support for transferring files to and from a PC.

However, the thing that really sets this collection apart from others of its kind is its



This is a still-shot of one of the many animations on the CD Exchange CD-ROM.

interface. The interface has been designed to be executed from startup, which is fine if you are using a CDTV, CD32 or one of the new bootable CD-ROM drives for the 1200. If you are using a 1500, 2000, 3000 or a 4000, you will need to copy several files across and make some directory assignments in order to get the menu system up and running. The interface is a simple point-and-click affair that can be used for a variety of tasks. It can view fonts, play music and samples, play animations and display pictures.

The contents of the disc are unpacked, so they can be run, viewed or played straight from the CD. Despite this lack of compression there is still a vast amount that has been stored on the disc. In my opinion I think the ease of access outweighs the reduction of storage capability. It means you can just stick the disc in your drive and use the contents immediately without having to wait for files to decompress. However, one or two demos and slideshows have comprised with DMS as they need to be run from floppy.

The picture directory takes good advantage of the fact that the images can be viewed straight from disc. It has a slideshow icon that basically uses Viewtek as a default tool to view all of the picture files. The pictures themselves vary in quality, but have a distinct leaning to the lower-end of the quality scale.

The animation directory, however, makes up for the lack of stunning still images. There are three directories: one for Tobias Richter's work, one for Eric Schwartz's and a third for others. There really are some good animations especially from Mr Schwartz. There are some of my favourites from other animators such as Mean CD Machine by Craig Collins and a transforming Valkyrie from the Robotech and Macross anime series.

The sounds directory was a bit of a surprise – I

expected to find the usual modules and instrument samples. I did, but I also found several amusing samples as well as some breakbeats. Although the breakbeats tended not to be very well looped the vocal samples were excellent. What's more, they were actually named phonetically, so you almost knew what the samples would sound like before you even played them. The vocal samples are taken from 80's funk records and one or two films, and are of excellent quality. Armed with this motley collection of samples, you'll be producing hit records and appearing in copyright cases in no time at all.

The DTP directory contains a surprising amount of clip-art and fonts. In fact, there are 5000 black and white IFFs and 350 fonts in Compugraphic and Adobe formats. Unfortunately, the quality of the clip-art, as a whole, was not very impressive. However, the fonts were actually quite good and as they were not compressed you could view them before copying them. In fact, there is a font-viewing utility supplied.

The transfer directory contains all manner of goodies. It has DNet, Parnet, Sernet, Twin express and a clever utility called CD Access. Using CD Access, CD32-owners without expansion units are able to boot-up Workbench. It does this by creating a RAD disk and copying the files necessary to run Workbench and Twin Express or Parnet.

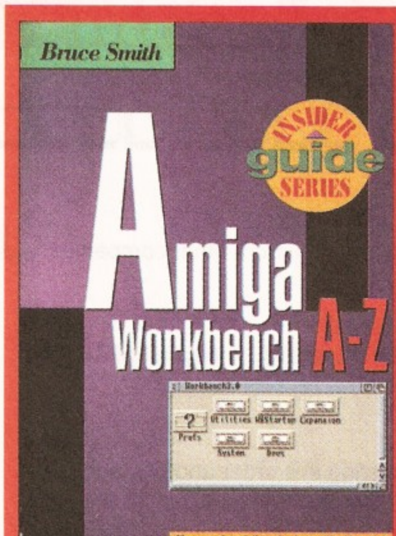
All in all, this is not a bad disc and there is a pretty good graphics section as well. But while it does contain some impressive innovations, the content itself is a little old. Despite this, it is still a good collection especially for beginners, although I prefer the AmiNet disc.

Product: ***CD Exchange Volume 1***
Price: ***£19.99***
Supplier: ***CD Exchange***
Tel: ***0603 666202***

Overall Rating: ***83%***

AMIGA WORKBENCH A-Z

Bruce Smith Books' Insider guide series of books has been meet with incredible success, and has been especially popular with newcomers to the Amiga. Amiga Workbench A-Z aims to join their ranks as the definitive guide to version 3 of Workbench. It sets out to explain all of Workbench 3's features in detail.



This book can tell everything you need to know about Workbench 3.

To achieve this aim, the book has taken an A-Z approach. Instead of following the normal book format, that usually consists of several chapters, this book simply lists each topic in alphabetical order. This design makes it easy to find the information you want, without ploughing through whole chapters.

However, while this is the most convenient way of obtaining information if you have used earlier versions of Workbench, this method is not ideal for beginners. If you have never used Workbench before you'll need to go through its features in a more relational order. The things you need to know do not usually come in alphabetic order. As a result it can be confusing for a beginner to have to keep moving from section to section. This book is more for people who have been using the Amiga for awhile and wish to find out about version 3's new features in the quickest manner possible.

The coverage of features is quite well balanced – simpler functions are given just a few paragraphs while more complicated subjects are of greater length. The coverage is pretty extensive too, there are not many features that I could think of that have been left out.

At the top of each subject is information relating to its Location, Format and Hotkey, if it has one. The Location is just a brief description of where you can find the feature, for example it may be under a certain menu or in a particular drawer. Format indicates if it is a directory, menu option or an icon.

The bulk of each subject is divided into two main sections. First of all is the Description. This simply explains what function it serves and a little more about its nature. The next sub-heading is the Use. Unsurprisingly, this section explains how to use the feature effectively. The instructions on how to use a feature are quite detailed and take you through the process step-by-step.

The book, as a whole, is written in a lucid and pleasant way. More importantly it doesn't "gloss-over" difficult concepts by bombarding the reader with lots of jargon and technical expressions. Once you have read a topic you will understand how it works rather than coming away more confused than before.

The layout of the book is also quite good. It adds to the readability of the material rather than hindering it. It manages to fit in a great deal of information without seeming crowded. This is also the case with screen-grabs, they do not take up too much room when they contain little detail and they are too small to see what is going on.

I really have mixed feelings about this book. On the one hand I can't help but think that a lot of the information it covers has already been supplied by the first A1200 Insider guide. Admittedly though, it does go into a little more detail but not all that much more. Despite this, it is still a well-written book and its A-Z format does have its advantages for those who do have some experience with Workbench.

Product: ***Amiga Workbench A-Z***
Price: ***£14.95***
Supplier: ***BSB***
Tel: ***0923 893493***

Overall Rating: ***85%***

SMART STORE PLUS

Zappo's external hard drive for the A1200 fits externally into the PCMCIA slot and works invisibly from Workbench. It runs quiet and cool, and the styling is well matched to the Amiga's own. Internal construction leaves a little to be desired but few people will ever see this and it does not affect the system function in the slightest. This drive is probably best known for the little external power widget that takes a 12 volts supply from the disk drive port. With this in mind, it was decided to check the current drain during spin up and hold.

(Current, measured in "amperes" is the amount of power required from the PSU: and too much of it is likely to cause clouds of blue, foul-smelling smoke.) Older model hard disks consume as much as 1 amp at 12 volts during spin up—as the drive's platters come up to speed and hold at perhaps a third of that. The Zappo draws barely one-hundredth of that amount for less than a second and even less when idle. This can only be attributed to the use of modern, lightweight materials and is a credit to hard drive designers.

What is perhaps more important is how this drive performs against a similar example. The review machine was fitted with an internal 230MB, half-height IDE which could be expected to outperform the Zappo by a fair margin. As things turned out, results returned by DiskSpeed 4.1 were far from expected. The graph shows read, write and create speed in Kb per second as averaged over all tests: with byte, word and longword buffers. In the table I've also listed a few other, less important results: but it should be noted the Zappo had been formatted without directory caching (DCFS).

The Zappo external may not be the only choice for PCMCIA-based hard drives, but it is certainly one of the better options: especially when budget is a major consideration. Note however, there is no provision for a RAM throughport or on-board RAM. Also note, these tests are typical for the review sample 130Mb drive only and may not be achievable with smaller drives.

Table 1: Direct tests for filing system analysis.

	Zappo 130	Segate 230	Unit
File create	17	15	Files/Sec
File Open	81	80	Files/Sec
File Delete	161	77	Files/Sec
Seek Read	61	59	Files/Sec
Dir Scan	302	631	Dirs/Sec

Table 2: Filing system analysis (Overall average)

Test	Zappo	Segate	Buffer	Unit
Create file	307	104	Long	K/Sec
Create file	31	194	Word	K/Sec
Create file	31	88	Byte	K/Sec
Write file	468	264	Long	K/Sec
Write file	28	256	Word	K/Sec
Write file	28	53	Byte	K/Sec
Read file	720	405	Long	K/Sec
Read file	195	412	Word	K/Sec
Read file	169	118	Byte	K/Sec

Product: ***Zappo Smart Stor Plus (130 version)***
Price: ***£249.99***
Supplier: ***Indi Direct Mail***
Tel: ***0543 419999***

Overall Rating: ***82%*** AS

AMIGA SHOPPER BOOK OFFER

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FASTER

Dozens of PD/shareware programs have been written to make your Amiga run quicker and to make it quicker to use.

BETTER

There are programs that add commands to AmigaDOS, supercharge your icons and even give you a whole new interface.

CHEAPER

Most of this software costs a fraction of the price of commercial equivalents – the rest is free.

"...if you have a need for a word processor, I strongly suggest that you check out this program before you spend 30 or 40 times as much on a 'commercial' offering..."

"...you can launch any program, or perform any DOS task, just by hitting a function key along with a modifier..."

"...if you've ever wondered how the hell to print out documents using both sides of the paper, this is the program for you..."

"...this is one utility that should be installed on every Amiga..."

"...I've not even seen a commercial accounting program with this range of features on the Amiga..."

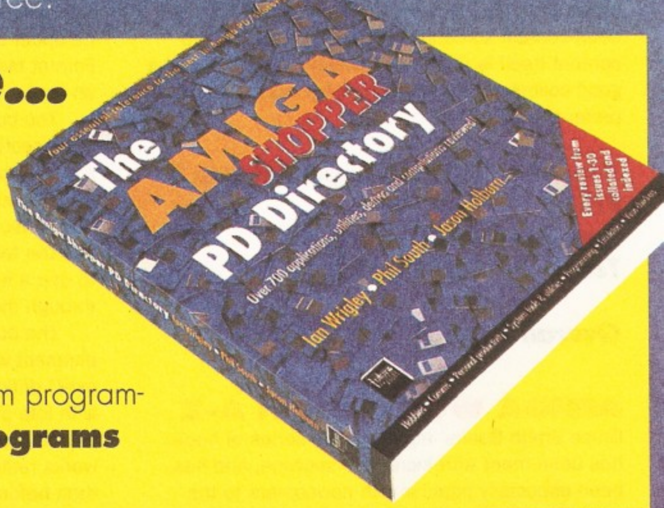
"...if you have any thoughts of creating a disk magazine, I suggest without reservation that you get hold of a copy of this package without delay..."

Just some of the comments in the reviews!

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AS43

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Know what I mean?

Discover what the top industry figures really think.

Gordon Keenon and John Campbell of the 24-bit Club on 3D modellers.

Every single Amiga magazine you pick up these days appears to have one thing in common – an abundance of 3D-related articles. Everyone wanted *Imagine 3.0* to review first, and now it's *LightWave's* turn, but spare a thought on a subject that nobody has ever brought up before, 3D object creators.

From the volume of people using *Imagine* or *LightWave*, the actual amount of people who actually bought the software is probably quite low. The usual cries of the software being priced too high is a lot of nonsense when you consider what these packages are capable of doing. But what about the companies who are slowly manipulating you by giving their older version of software away free...

Companies like Impulse have made copies of their older software available free, or at ridiculously low prices to try and hook new users, and monopolise the market. When they do this, it encourages unrealistic expectations, that can do a great deal of damage to small companies who can only survive with good sales of models they produce.

When users have free copies of *Imagine 2.0* thrown at them, some start to believe they are entitled to other valuable software at little or no expense as well. This 'something-for-nothing' attitude is very dangerous and it's the kind of thing that can put developers out of business very quickly.

Since so many 3D users now have a modelling program, and are willing to give up their models for free through PD software and BBSs, *professional* 3D modellers are now some of the most underpaid and unappreciated artists working today.

The cheap accessibility of programs such as *Imagine 2.0* is promoting a general disregard for the time, skill and artistry it takes to create high quality models. There appears to be a feeling that "if I can get *Imagine* stuff for free, why should I buy someone else's work". This has led to rampant piracy and another nail in the Amiga coffin.

As an example, we spoke to Tim Wilson who created "*Humanoid*" for *Imagine* and *LightWave*. He said "Sales of *Humanoid* for *Imagine* did comparatively well in its first few months of release, selling a few hundred copies. Despite excellent reviews, shortly after it began appearing on the pirate boards, the sales dropped off to practically nil. Out of some 300,000 owners of *Imagine* (as reported by Impulse), I have difficulty believing there are still only a few hundred using *Humanoid*."

Some of you may think that this is the same tired story of software developers being ripped off because their prices are too high, but as an example of just how ignorant people can be, one of our members (Steve Criddle) released algorithmic textures for *Imagine 2.0* as *Postcardware*.

We uploaded his textures to BBSs world-wide, and found that it was distributed to every major 3D BBS within a week. From all the thousands of users out there who took this texture set, only *one person* had the decency to send Steve a postcard...

How much effort does it take to *buy a stamp* and *postcard* and pop it in the post?

If this attitude continue then we feel that *you* the 3D user are going to lose out in the end as these very talented people will just keep all their work to themselves or, even worse, maybe move over to the PC... ***Gordon & John***



"There appears to be a feeling that if I can get Imagine stuff for free why should I buy someone else's work. This has led to rampant piracy and another nail in the Amiga coffin."

Graeme Sandiford, our excellent writer, spreads the Word among PC owners.



"You see, as soon as you mention the Amiga they think of games. I don't know, maybe I have some form of speech impediment and when I try to say the word 'Amiga', it comes out as 'games machine'.

One of the things that almost seems part of the British tradition is an almost obsessive interest in other peoples' occupations. Now I know this an odd thing to be mentioning in a computer magazine but it is computer-related – just bear with me a bit longer.

This obsession often comes to the surface in informal events such as dinner parties, where the one question you'll always be asked is, "so, what do you do for a living?" Don't get me wrong, I'm proud to be working on the world's best 'serious-only' Amiga magazine, but I still dread that question. There are two ways a person might react to my answer. First, those who have no interest in computers soon have a glazed expression on their face, begin nodding rhythmically as if the Blue Danube was being played at a sub-sonic level, and start chanting "really, really, reeeally".

However, it's those who are interested in computers that I find most irritating. They usually respond by asking, "what's it like playing video games all day?" You see, as soon as you mention the Amiga they think of games. I don't know, maybe I have some form of speech impediment and when I try to say the word "Amiga", it comes out as "games machine".

A more likely explanation is that most people outside of the Amiga community simply don't know what the Amiga is capable of. The simple reason for this is that they haven't been told. The Amiga is the computing world's best kept secret and that really gets my "dander" up. The Amiga is a wonderful machine and I am fed up of being sneered at by PC-owners who don't know the first thing about it.

The solution to this is not a simple one – running to the top of a hill and shouting, "the Amiga is a wonderful machine", as loud as you can, is not enough. The solution is a marketing one – Commodore need to learn from their competition. For example, while explaining to a friend, who works for a large PC manufacturer, just what the Amiga can do, he interjected, "oh, so it's Intel inside".

Now, does the last part of that sentence ring any bells? It should, it was part of a slogan used in an advertising campaign launched by Intel. It was plastered up and down the country on bus stops and posters.

So, did the campaign work? You're damn right it did! Judging by the number of bearded-men, who had no idea what part of a PC Intel made, that were queuing up in Dixons insisting that any PC that they might buy must have "Intel inside".

Unfortunately, while the Amiga has earned some street-cred in the USA, usually under its Toaster pseudonym, it has yet to receive the respect it deserves over here. While the production of such stunning graphics as found in TV programs such as *Robocop*, *DSV* and *Babylon 5* have impressed many, people still don't accept the Amiga as a "serious machine". To be absolutely truthful, this really has been the fault of Commodore, who have insisted on marketing the Amiga in Europe as a games platform.

Now that I've had my little rant and rave, let's move on to a more positive note. One of the things I would like to see in the New Year is a Commodore, in whatever shape or form it emerges, that will exploit this untapped market. Hopefully we will see a new company that will have the freedom to really develop the European market. At the very least, it should help me enjoy my social engagements a little more. ***Graeme*** AS



Computer graphics is a very hard science and we will continue to see a lot of progress in this field.

Straight Talk

R. Shamms Mortier seeks out another true philosopher and Amiga King: Roman Ormandy, the developer of Caligari and TrueSpace.



Roman Ormandy believes the impact of TV has not been liberating, instead it has homogenised the society.

> *"The spirit of the people that have embraced the Amiga is awesome."*

My personal copy of *Caligari*, the first *Caligari* product released some eight or so years ago, is number one. Basically, I read an interview with Roman Ormandy in a magazine (I can't remember which one) and called him immediately. The first disk rolled off the disk copier and into my sweaty eager hands some months later.

I have been with it through all of these years of change and development. I have also interviewed Roman at various points over the years. This one was the best one, however, since we got right to the important stuff right off. It was also important because it touches upon many things that are going on right now, including the present transition to a new corporate entity. The interview was very hard to get, even though I know Roman very well. He's just so busy these days.

Finally, over the phone, with a skeleton of his answers needing more meat, we concluded this piece in time for the last press run.

You have one of the most interesting backgrounds of any developer that I know. Can you detail some of your background, with special attention to your initial training in computer simulations and software design ?

I graduated with a degree in Computer Science with an AI background (Bratislava Komensky Institute and the Prague Charles university post-graduate). I specialised in knowledge representation in both Psychology and Linguistics. In Linguistics I was most influenced by Wittgenstein's work "Philosophical Investigations".

How would compare your training and preparation in Europe with that offered here in the U.S.?

I only took two semesters in US at City University in New York. Although US education is not great it is still better than that of Europe where "high-quality standard education" still cranks out standardised mass educated factory products just like in the centuries past. Our society is more visual, although I must admit that the educational lobby has frightening power and is determined to stop progress at any cost. Over the last few years I have developed quite a dislike of highly literate people due to their inability to realise that the technological basis of their moral superiority already is completely eroded. Only the government has the same problem.

Do you know of any differences now that the Communist world has crumbled as far as preparation and training for work in computer software design and related areas? Is the state-of-the-art technology available to students?

The western world completely failed with regard to East European democracies. We will pay a high price for this. In my opinion the so called "European Union" died in Bosnia two years ago. I do have high hopes for the newly democratic regimes in Eastern Europe. When they finally realise that the West will not help them, they will do just fine and will follow the same path as many of the new and prosperous Asian nations.

What was the core of your advanced work about when you were involved in your studies, and how has that manifested in what you are doing now?

I worked on what is called AI (Artificial Intelligence) knowledge representation. Traditional AI never delivered any decent theory and even today we hear promises that cannot be kept, like speech and handwriting recognition. The current approach is not only not 97 per cent accurate, rather 100 per cent wrong. Contrary to all of that, Computer Graphics is a hard science and we see, and will continue to see, a lot of progress. Every year you go to the shows, you see works presented by major scientists that develop into major products in a short amount of time. We are creating a new communication medium. I wrote a document called the "Caligari Manifesto" (about 40 pages) which explains it in detail. Interested parties can write to me for a copy, though I'm also thinking of placing it on our bulletin board as well.

Where did the idea for the name "Caligari" first originate?

Caligari comes from the 1919 German expressionist movie "The Cabinet of Dr. Caligari". He's a bit of an unsavoury character, but the energy of the film fits our exploratory mode. The visuals in the film are very advanced.

What were those first years like as far as trying to get established and breaking into the market?

Then I had an infinite belief in my vision and skills. Today I am concerned. I am afraid of how much work it takes to produce results. There's still so much to do. There's too much left to be done. There's more competition for a small pie.

How have your goals changed over the years in reference to Caligari (and also TrueSpace")?

Our goals never changed. Caligari Corporation is in the business of enabling human communication by visual (rather then verbally symbolic) means. Our society is dominated by printed symbolic communication. We live in the legacy of the Guttenberg galaxy. We are doing away with the supremacy of the printing press, and many good literate people who are in power in the cultural

establishment are not going to like it. The three "Rs" which cause the criticism of the young by the older generation are superfluous. There is very little that is relevant anymore from the normal standardised educational process. Recently Al Gore showed up at SGI and envisioned the day when computers would connect to the local library. I hope this will never happen, because twenty-first century communication media should not be connected to a 16th century repository of knowledge. It is not going to be books that drive evolution from this point onward.

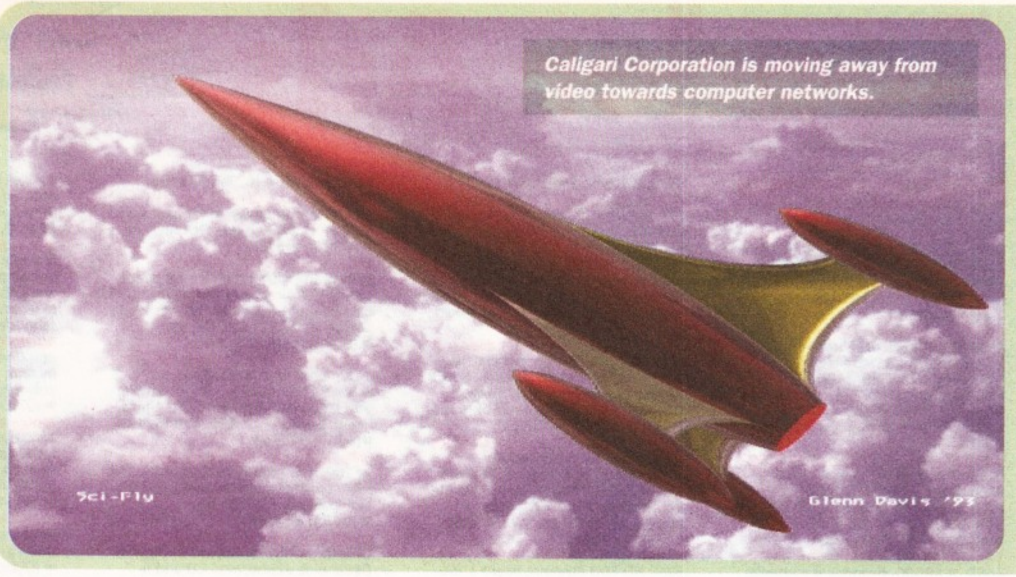
Caligari Broadcast is a very high-end product. What differentiates it from both its predecessors and also from the other Caligari products?
To be honest, *Caligari Broadcast* is not that much better than *Caligari24* but is much poorer than *TrueSpace*. It was developed for the special needs of the broadcast video community. Today we are moving away from video toward computer networks. Video is still a linear medium. The impact of TV has not been liberating, instead it has homogenised the society. The essence of computers is interactivity. We are getting much closer to interactive simulation. In *TrueSpace 1.5* we will have the ability to move solids around like an SGI workstation does. *TrueSpace* technology is very advanced, and if there will be an Amiga 5000, we will port *TrueSpace* to it in the next generation.

What are your personal favourite tools in Caligari Broadcast in terms of uniqueness and use?
I like the overall composition of the program and its interface. *Caligari* wasn't that "feature rich" in the beginning. It was designed for people who wanted to visually express themselves, like artists and animators. *TrueSpace* may have come to the level of being both user friendly and very complete.

Commodore's actions over the years hurt many developers like yourself. If the Amiga is to be taken up by another entity, what sage words of advice could you offer?
Be honest. There is a tremendous equity in the Amiga. The spirit of the people that have embraced the Amiga is awesome, even though Commodore tried its best to kill it. The things that happened with the Amiga will never happen on windows. It was a democratic grass roots movement. It doesn't happen all that often.

There is a good group of users who use Caligari (especially the broadcast version). Will Octree continue to support them with upgrades in the near future?
We will support our existing users. As far as the next version we need to see a real living company, delivering on its promises (specifically the "next generation" Amigas) before we commit to any future development.

Are there any upgrades for Caligari Broadcast in the works at the moment?



Caligari Corporation is moving away from video towards computer networks.

Not until we see that someone is serious about taking the Amiga to the next step.

Where is the computer graphics revolution heading in your opinion?
Into the home. The next generation of game machines will probably be actually superior to the midrange SGI machines of today. Sony and Caligari have signed an agreement that makes us the 3D designers for the Sony Play Station, a miniature work station and game station combined. They will be tremendously powerful machines, and are due out in the near future.

"Ignore the wisdom of the current generation. It will be useless for you."

What do you see as some of the advances coming down the pike in the near term?
Collaborative environments on the networks. The network based Operating Systems will soon have a 3D interface. This is an answer to the human physiology. We have developed over millions of years to appreciate a 3D environment, in fact we require it. Our representation of the world is not static. It is three dimensional. A 3D desktop environment is a fraction of that environment, but why remain there? The civilisation of the printing presses was extremely detached from reality. The literate person, the rational person, is extremely detached. The coming digital technology will bring us closer into the reality of a global village.

As an advanced and thoughtful developer, where do you see the development of the "information super-highway" taking us, and how is Octree playing?
The "Information Super-Highway" is not really a highway, rather each of us gets to choose where we want to go. Folks at ABC, CBS and CNN (and the New York Times) will not like it. I do not think that it is normal for the US media to spent more time on OJ then on historical events in large sections of the world. Rather than complaining about the media in the future we will be able to simply ignore them. The most serious and negative idea was that of the Clipper Chip by the present administration, a way that government can control the free access of media that computing represents.

I heard that your organisation has just gone through a name change.
We are no longer Octree Software, now we are the Caligari Corporation. We used Octree as a name I invented that represented a box of space, but I mostly liked the word "tree" as an organic idea. People react better to the sound "Caligari", even though many think it is of Italian origin.

All of the developers that I have spoken with over the years have unique views of the world, and also very strong personal work ethics. Can you speak about your views on both counts?
I do not believe in standardising people. We at Caligari strive for excellence. Our government, which is ostensibly defending human rights, is no longer excellent,.. not even mediocre. Our senators "re-elected the 17th time" in their office are an embarrassment. The institution of Congress in its current shape is at least a hundred years behind our times.

What is a "normal" day like at Octree, if there is such a thing?
There are no normal days. After so many years of hard work it can get tiring, but there are always little successes which make the lives of all of us a little more bearable. And there is always the grand goal in the distant future.

What advice would you give to young people attempting to work in fields the same as or closely related to yours?
Ignore the "wisdom" of the current generation. It will be useless for you.

Are there any concluding remarks you would like to share?
If the Amiga is continued or discontinued, our lives will still go on. The Amiga community is real and strong. We have seen the products and read the bulletin boards, and argued to create better products and really knew each other more than the other platforms. It wasn't just the marketing that created products. They were created because of creativity and need for all applications. That's not true on the PC or MAC. There always has been a tremendous brotherhood of users. I hope the spirit of this survives, no matter what. AS

INFORMATION

● All of the graphics in this article were created with the Caligari Broadcast software from Caligari Corporation, 1955 Landings DriveMountain View, CA 94045
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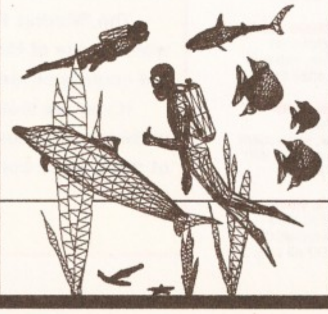
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- Claudia
- Shad Art (2)
- Worlds Beyond (3)
- GIF Beauties (14)
- Bodyshop 1,3
- Bodyshop 2,4,5,6,7 (2 each)
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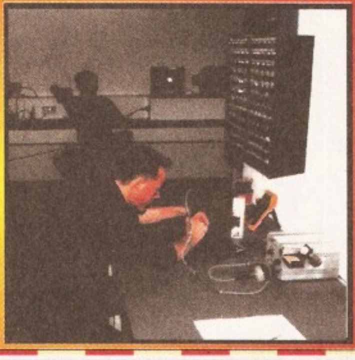
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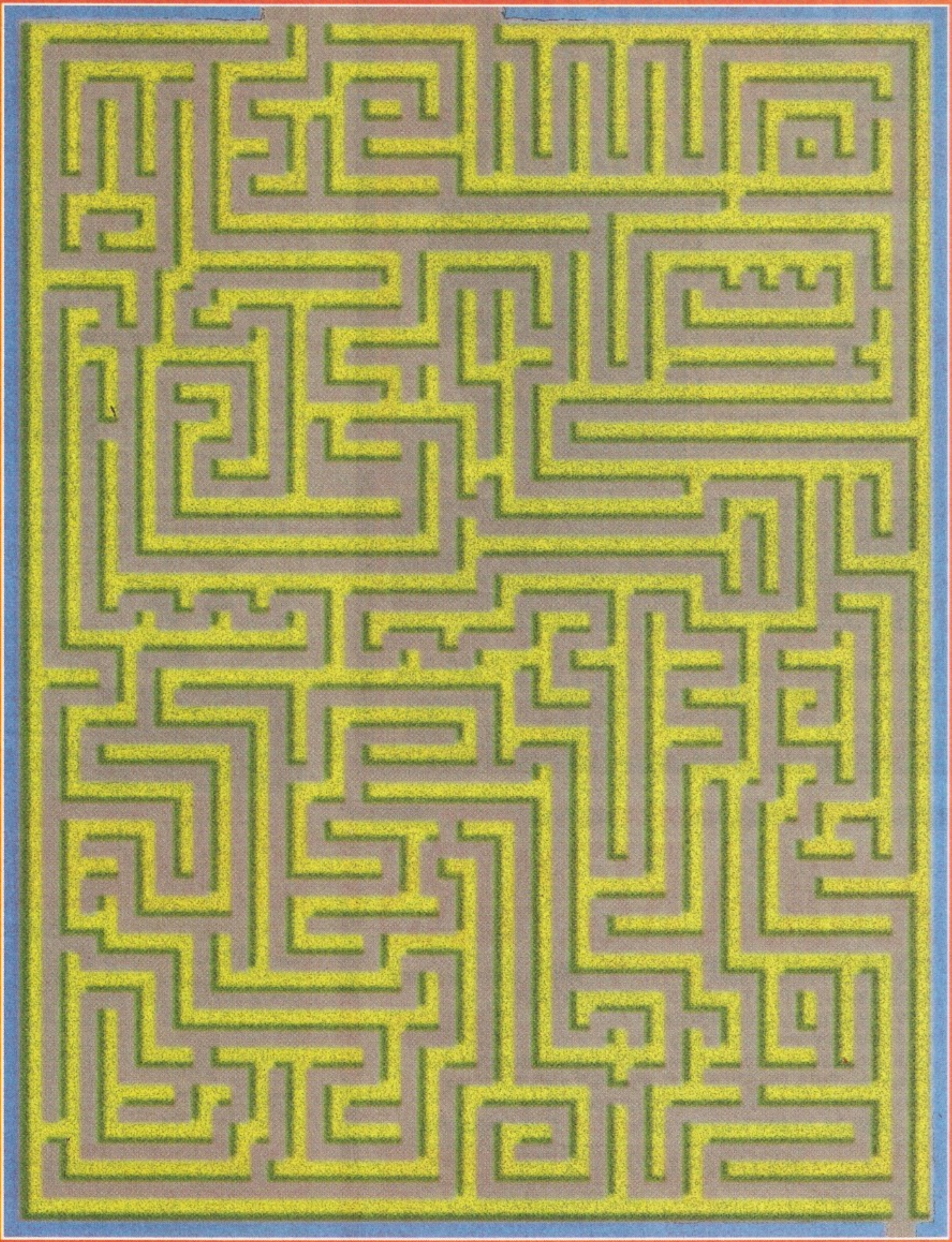
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LET OUR EXPERTS HELP YOU THROUGH THE AMIGA MAZE



USING THE ICONS TO FIND WHAT A QUESTION'S ABOUT



Beginner questions raising basic problems.



General Amiga-related queries or questions.



Queries related to Amiga desktop publishing.



Questions about monitors and TV displays.



Queries relating to general hardware problems.



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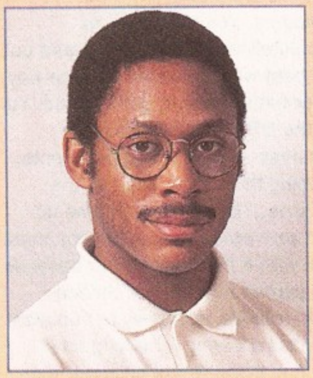
Software packages and programs queries.



Questions relating to comms, including modem.

AMIGA ANSWERS

NO PROBLEM!


Graeme Sandiford is in.

Hello and welcome once again, to the area of *Amiga Shopper* where you can turn to find all the answers to questions concerning your Amiga. It's my privilege, as *Amiga Shopper's* technical writer, to make sure that not one of your problems is left unsolved. Don't worry, we can help – no matter how simple or complex they may be. At *Amiga Shopper* we want you to get the very best out of your Amiga. That's why we devote more space than any other magazine to this indispensable service, so please make the most of it and keep your questions coming in. We'll do my very best to find a solution to all your problems.

Don't worry if you come across any unfamiliar terms, just turn to one of our jargon-busting boxes to receive an explanation. The problems are put in a wide context for everybody's benefit. The index on the previous page is your guide to the topics covered this month.

By now, you are probably familiar with our team of Amiga experts. **Mark Smiddy** knows all there is to know about AmigaDOS and floppy drives. **Jeff Walker** is our desktop publishing, fonts and printer correspondent. **Gary Whiteley**, is a trusted expert on video applications and graphics. If you have a query about comms, we'll set our communications guru **Dave Winder** on the case. **Toby Simpson** is our code clinician. If you've got problems with anything from C to assembler, try taxing his little grey cells. Finally, we've got a man you can rely on when it comes to operating systems programming – **Paul Overaa.**

PRINTED CIRCUIT PRINTING

SOFTWARE

I am currently using Pro-Net 2 and Pro-Board 2 to make PCBs for my electronics work and although they work reasonably well, they still leave a great deal to be desired. For a start they only work from Workbench 1.3 and do not appear to work with my NEC P2200 printer. Do you know of any commercial PC CAD packages that don't cost an arm and a leg; will work on a standard printer; and can output to a laser for transparency work.

I'm not interested in the PD route, but if that is the only option left open to me could you give me some idea of the programs? Also, could you print my full address since I would like to hear from anyone else who uses the Amiga to produce PC boards.

Mr A. Bradley
Lincoln LN4 1HF

I must confess to having no experience with autorouters on the Amiga and although I also have a Macintosh and a PC, I'm still masochistic enough to do everything by hand! That's what I get for being brought up on a diet of ETI and stripboard… oh well. The only design programs I've seen on the Amiga were in the "Fish" collection and they weren't really up to much.

One route you could take is buying an emulator for your machine: such as the Vortext Golden Gate and getting hold of one of the low-cost commercial PC autorouters. The reason these have not taken off on the Amiga is, I suspect, that very few people have the hi-resolution monitors required to do the job properly. If any readers have experience in this area, I would like to hear from them too. ***Mark***

MARK THE RIPPER

SOFTWARE

Is there a program grabbing sounds and music where you press one hot-key to start recording and another to finish, and then the grabber puts the data into a file which can be loaded into a soundtracker straight away?

Mark Pierce
Poynton, Cheshire

What I think you mean is that the program saves the music from a game or demo as a soundtracker type tune, which will load into a tracker program with all the sounds and channels and stuff ready to be edited or whatever? Such programs are knows a "rippers", and I am reliably informed that currently the best of the bunch is called Exotic Ripper. Should be available from any PD library. ***Jeff***

OBSCURING PROBLEM

DTP

I've just been designing a small booklet in ProPage for our local Summer Gala, and I drew some pictures to use in it. I drew a small shield for one advert, which I thought was quite good until I used it. The shield has a rounded bottom edge, but the box it is in doesn't, so it obscured slightly more of the graphic underneath it (vertical parallel lines) than it should have done. I had to fill in around the bottom with some short lines to make the picture complete again.

I had problems with one line. I simply could not get it to be straight when printed. I checked the line at 400% magnification and it seemed OK on the screen. I drew one line and cloned the rest, so they should all have been the same. Any ideas why this one didn't want to play the game? Also, is there any way to have a box with rounded edges, and is Gold Disk going to develop ProPage any further?

A Bradley
Lincoln

You didn't tell me what software you used to draw the shield, so I'm going to guess it was a bitmap created with DeluxePaint or the GrE graphics editor that comes with ProPage 4. Bitmaps have to be rectangular, so even though your shield is an irregular shape it has to be saved in a rectangular bitmap, which then has to be imported into a rectangular bounding box. ProPage does not allow any "transparent" colours for bitmaps, so white is always white, never see-through.

Your graphic would have been better drawn in a structured drawing package like ProDraw. With this you would have first drawn your vertical parallel lines, then created the outline of the shield as a single object and given it a white fill colour. When you then placed this on top of the lines, you would have got the desired effect of the lines running continuously behind the shield. Next you would add the design for the face of the shield, then finally group the lot, save it as one structured graphic and import it into ProPage.

Alternatively you could have just drawn the shield and shield face design in ProDraw, again with the white fill colour for the shield, and imported just that on top of lines drawn in ProPage. Structured drawings can be any shape you like and can have transparent areas around the edges (select Transparent in the Active Box requester); bitmaps must be rectangular and can't have transparent areas.

The printout glitch is a frustration which sometimes happens with structured graphics – on all platforms and with all software, not just with ProPage on the Amiga. It is closely related to the output resolution and is probably caused by rounding errors in the vector calculations – the higher the output resolution, the fewer (or the smaller) the rounding errors. Then again it could simply be a bug in ProPage. Try deleting the offending graphic/line and drawing it again from scratch. This creates a complete new vector with completely new numbers which may not suffer so much from the rounding errors as the previous vector.

As far as I know Gold Disk has no plans to further develop ProPage. There is some talk of fixing it because it appears to have all sorts of problems in 16-colour mode on an A4000 running Kickstart 3.1, but I certainly wouldn't hold my breath. Probably best to pin your hopes on PageStream 3. ***Jeff***

SCRAMBLED DISPLAYS

MONITORS

Having read good reviews of the Microvitec 1438 multiscan monitor I decided that it sounded like a good investment. After some shopping around I finally made my purchase from Silica in Glasgow.

On returning home with my prized new "toy" I immediately connected the 1438 up to my Amiga 4000/030 via my GVP G-Lock's RGB pass-through. On powering up I was pleased to see a familiar, if somewhat duller-than-normal screen.

Then I decided to try some of the higher resolution screen modes. I made sure that the DblPAL, Multiscan and Euro72 drivers were all ready and available and then selected mode promotion and a DblPAL screenmode.

Imagine my surprise when instead of the pin-sharp display I had expected the screen was distorted almost beyond recognition! I tried the other screen resolutions mentioned above but the monitor would not lock to any of them.

I'M GOING FOR IT... LIFE AFTER REDUNDANCY

BUYING

I am possibly soon to be made redundant with a large payout (more than £30,000) to smooth my furrowed brow. I fully intend to try to work for myself and do something with my computer in desktop publishing.

My current computer and other hardware is as follows: A1500, 8833 monitor, NEC P-2200 24-pin printer, 68030 accelerator with 4Mb RAM and 68882 co-processor on it, 210Mb SCSI hard disk with 4Mb RAM on it, Golden Image mono hand scanner. I also have a Microway Flicker Fixer but do not have a multiscan monitor.

The software I use is: ProPage 4.1, ProDraw 3, Superbase Personal 4, Excellence 3, Maxiplan 3.5. Would ADPro be of any use to me?

Do you consider this enough to start in business? If not, what would you consider I would need to buy in order to have a half-decent chance of success? Maybe a larger hard disk? Or a flatbed scanner? A laser printer would be needed I think for proofing? What about a 24-bit graphics card?

I know that success isn't going to happen, even with the very best equipment, if you are no good at it or can't get the work. But I think I have a reasonable flair for drawing and intend to give it a whirl.

A Bradley
Lincoln

Look, I'll talk about equipment and stuff in a bit, but first I want to give you some general advice about striking out on your own. Please take the time to read and think about it because you are making a life decision and it is so easy to rush in full of enthusiasm for the dream but blind to the unpleasant realities.

The decision you make may not affect only you, but also the rest of your family – most especially your wife and children if you have them. When you go into business for yourself you must expect to earn absolutely nothing for at least 18 months, perhaps longer. This will mean going without certain of life's luxuries – luxuries like steak for dinner, nights out down the pub, a new suit of clothes, repairing that leaky roof... As for holidays, new cars, new furniture and so on, forget it. Believe me, that £30,000 may sound like a lot right now, but it's easy to fritter it away very quickly when there is no money coming in.

So if you are married, Mr Bradley, you need to talk to Mrs Bradley about it and make sure both of you understand that before you can go out and order that Rolls the lifestyle you are both used to is going to change for the worse, for quite some time. You will both have to accept that for two or three years you may have to work 16 hours a day, 7 days a week. You will become strangers. You both have to absolutely accept this and figure out the best way to live with it. One way is for both of you to get involved. You do the DTP, your wife runs the business side – getting the clients, keeping the books, chasing the invoices... By all means come up with your own solution, but you must deal with it before you start because you cannot expect your chosen partner in life to happily put up with you disappearing for a long time.

And if you've got children, then you should talk to them as well. They may have to go without that latest games machine, wear cheap pumps instead of Reeboks, take a cut in pocket money... It's only fair that

Thinking I had a faulty monitor I called Silica. They suggested I bring the monitor in for inspection. I did, and was very courteously dealt with. I was amazed to see that the monitor worked perfectly in DblPAL on one of Silica's A4000/030s.

I explained that I was using a G-Lock with my set-up and the assistant quickly produced one from stock and connected it up. As before, the screen became very distorted and was only cured by reverting back to a standard PAL screen. The assistant reconnected a stock 1438 to the A4000/030 and G-Lock setup and once more the screen became distorted in DblPAL mode.

It was obvious that both the monitor and genlock worked perfectly when independent of each other but when put together they will only produce a standard PAL screen.

The point is, why are we not told about such problems before we part with our hard-earned cash? One of the Amiga's fortes is its application in video work which, for most users, will involve the use of a genlock. Are all genlocks likely to exhibit the same failure to pass higher frequency signals through the RGB port or is this peculiar to the GVP G-Lock or to low-end genlocks generally? Or is this a limitation of the Microvitec monitor which other multiscan monitors do not have?

Perhaps you are aware of this type of problem? If so, maybe I should have been aware of it too – but I've never seen anything in any publications relating to it.

Incidentally, Silica were extremely helpful and refunded my outlay without any hesitation, but perhaps other suppliers might not be so understanding or as willing to return your cash! So, my suggestion is, "buyers beware"!

Dave Murray
Westwood, East Kilbride

There's a simple explanation your problem: genlocks convert the Amiga's RGB signal to a PAL video signal so that they can do their overlaying with incoming video. A PAL video signal runs at around 15KHz horizontally. When you input an RGB signal to the genlock at higher than normal frequencies (e.g. 30KHz or more, such as provided by DblPAL or other mode promoted screen modes) the genlock is unable to convert it to a PAL video signal, hence the scrambled RGB output. Genlocks require a 15.6KHz PAL video input.

However, to display the higher screen modes requires syncing the monitor to higher frequencies and this requires that it be fed a correct signal. A DblPAL signal fed through a genlock will exit the genlock's RGB pass-through in a mess, so the monitor tries to display that mess. It does, but it isn't what you want.

Unfortunately, this is how things go. All your equipment is probably working fine, but it was not designed to be put together in the way which you tried. A solution (though I don't know where you might find one) is to get hold of a switching box which will take the RGB output from the Amiga and switch it between either your G-Lock or your monitor so that you can do video work when you want to or have mode promoted screens at other times.

I don't know of any genlocks which will allow you to work in higher screen modes (there probably aren't any) so you'll just have to use the switcher work-around or be prepared to disconnect your genlock when you don't need to do video work and use promoted screen modes. ***Gary***

PANDAAL GONE AWAY

BUYING

Recently I bought a Zydec mono hand scanner from a market stall. Everything seemed in good order but, sadly, the software – DaataScan 2.0 – was faulty. I wrote to Pandaal, who make the software, but they have moved on.

Do you have any idea of Pandaal's new address, or maybe another software package that will work with my scanner?

Peter Alan Taggart
Wootton, Wilts

Alas, Pandaal ceased trading some time ago. And, alas again, hand scanner software works closely with the scanner interface so it's not just a case of getting some more software. Both Power Computing (0234 273000) and Golden Image (081-365 1102) will supply you with new software and scanner interfaces to use with your existing scanner head. ***Jeff***

NEW AMIGA, NEW PROBLEMS

VIDEO

My query is in regard to using two video titling programs – Broadcast Titler 2 and ProVideoPlus – on my new A1200. Both programs used to work fine with my A500 but now I've got problems.

When I boot using the ReLocKick disk I can get BT2 to boot with no problems but if I install it on my hard drive I am instantly confronted with the font requester page and that's where it sticks. What's going on here?

When I try to run ProVideoPlus all I get is a Workbench screen. Help!

Frank O'Shea
Pontardulais, W. Glamorgan

I'd hazard a guess that ProVideoPlus doesn't work on your A1200 because it's quite old now – and certainly pre-AGA in its design. Which would mean that it wasn't written to run on AGA machines such as the A1200, and so it may not work properly. As seems to be the case as far as you are concerned.

As for BT2, I spoke to distributors Meridian Software and they said that they've been inundated with user problems in regard to BT2 working on AGA machines. Apparently it works OK on some machines and not on others – but nobody seems to know why. Meridian suggest that you call or fax Innovision Technology (Tel: 0101 510 638 0800, Fax: 010 510 638 6453 – marked for the attention of Tom Patrick), the makers of BT2 and ask them if they've solved the problem yet. There was suggestion that Innovision were going to release a version of BT2 which supported AGA but this doesn't seem to have happened yet.

So it seems that you're stuffed, at least as far as BT2 and PVP go. My best suggestion would be to first contact Innovision, then – if you get no joy – consider shelling out some big bucks for Scala MM300. You could also try using WB3 instead of ReLocKick and see if that helps.

The bottom line is that times change, machines improve and some software gets left behind. Unfortunately, that's how it goes in our

I'M GOING FOR IT... LIFE AFTER REDUNDANCY

they should be consulted because your decision is going to affect the rest of their lives, hopefully for the better, but maybe for the worse, and definitely for the worse for two or three years, which seems nigh on a lifetime to children.

And so we get to equipment. The most important bit is that grey soft stuff between your ears. With enough quality wetware you can work wonders with next to no hardware and software. What you've already got – hardware and software I mean – is plenty to get started. There will be thing you will not be able to do. So don't do them! Look at what you've got, decide what is and isn't possible, and then just do what is possible. Later, when you can afford it, or when a definite job is in prospect but one that requires more equipment... you can buy more.

PostScript still rules the DTP world, so I would say you have to be PostScript compatible. You will need to proof your PostScript output, so a PostScript laser printer will be one of your most important assets. If you intend to provide clients with full-colour documents that include photographs, then a 24-bit flatbed scanner is essential. If you are scanning in 24-bit colour, then lots of memory (16Mb, preferably more) and lots of storage space (1Gb perhaps) will be a requirement. Although a 24-bit graphics card isn't essential, it sure helps if you want to retouch or manipulate 24-bit graphics. If these full-colour PostScript documents and graphics have to be transferred to an output bureau (they will), then a removable storage device (like a SyQuest) will be required. In this paragraph I've just spent about £4,000. See? It's dead easy to spend money.

So my advice is to first assess what your prospective clients will require of you, then spend no more than is necessary to add to your equipment so as to fulfil those requirements. Pardon? You don't actually have any prospective clients? Tch, tch, tch. Bad. Very bad. It's no good deciding what you can do and then trying to sell it. That's what artists do and you want to earn some money rather than have people admire your work and walk away, don't you? So you have to find out what it is people want to buy, and then provide it.

How do you find out? Very simple. You ask. Walk into any place of business, point at some promotional material (brochure, booklet, poster, letterhead, business card...), compliment it (never, ever, criticise!) and tell them that's what you do and that you are local and could give them a competitive price for the same quality. (But, boy, had you better be able to deliver!) Don't know what to charge? Yup, tricky one. You'll have to somehow find out what they are paying. That's why the most important equipment you own is that grey squishy stuff between your ears.

Now then. I hope I haven't put you off because working for yourself can be the most rewarding experience. At times you may feel absolutely shattered and wonder how you will ever make ends meet, but when those ends do meet, the tiredness fades away and is replaced by the most wonderful feeling of accomplishment. I wish you all the luck in the world, Mr Bradley, and I'd love to be there to see your face when you frame and hang that first piece of paid-for work on the office wall. ***Jeff***

fast-moving world of high-tech. ***Gary***

LETTER FROM AMERICA

MONITORS

I'm in the USA so this is mostly an NTSC question. I have a regular VCR with flying erase heads but it is not frame accurate. I use my 1Mb Amiga 500 for creating animations but because of my limited RAM I splice my small animations into larger ones by recording them onto my VCR. Which leads me to my three questions which I can't seem to find the answers to:

1) What are the "legal" colours on a NTSC (or PAL) system? I'd like to know this so that my colours don't bleed all over the place.

2) Why do most books on DeskTop Video recommend using interlaced screens? My non-interlaced animations seem to record just fine, whilst some of my laced ones are still flickery.

3) Why don't we have magazines as good as yours in the US?

David Myers
Cleveland, Ohio

1) The "legal" broadcast colours are those which do not exceed the agreed technical limits of saturation and luminance (brightness) in order that they do not bleed excessively or cause other problems when displayed or recorded as video. In general this means that no very bright colours are used, rather they should be toned down somewhat.

As an example I made a four-colour screen in Deluxe Paint using the following colours: Red (R15 G0 B0), Cyan (R0 G15 B15), Green (R0 G15 B0) and Yellow (R15 G15 B0). By passing this image through Art Department Professional v2.5's Broadcast Limit Operator the colours were modified as follows, depending on whether NTSC or PAL and Luminance or Saturation were used:

NTSC/Luminance – Red (R11 G0 B0), Cyan (R0 G10 B10), Green (R0 G13 B0) and Yellow (R10 G10 B0).

NTSC/Saturation – Red (R12 G0 B0), Cyan (R0 G12 B12), Green (R0 G14 B0) and Yellow (R14 G14 B2).

PAL/Luminance – Red (R8 G0 B0), Cyan (R0 G8 B8), Green (R0 G10 B0) and Yellow (R9 G9 B0).

PAL/Saturation – Red (R10 G0 B0), Cyan (R0 G11 B11), Green (R0 G13 B0) and Yellow (R13 G13 B1).

As you can see, each of the colours has been modified within the bounds dictated by ADPro's Broadcast Limit operator. Of course, if you don't have access to ADPro you could just ensure that the colours you use aren't oversaturated – for example instead of bright red (R15 G0 B0) use a darker red (e.g. R12 G0 B0), and so on.

2) Interlaced screens provide twice as much vertical information as non-interlaced ones (i.e. double the number of horizontal lines), and so produce cleaner-looking animations with smoother diagonal edges.

Sometimes only an interlaced screen will be stable enough to work with certain genlocks but you're right, non-interlaced screens work perfectly well in most cases, particularly if memory is tight or higher resolutions aren't strictly necessary. The most likely reason why some of your interlaced screens and animations flicker is that thin horizontal lines are either too close together or in highly contrasting colours. Try messing with the palette you use and avoid large colour contrasts when drawing thin lines.

3) Maybe because the established Amiga user base in the US is much smaller than in the UK and Europe and can't support such magazines, especially since many of the Amigas in the US are being used for fairly specific applications such as video production. Don't forget that you DO have Amiga World and Amazing Computing, however. ***Gary***

A500 PLUS?

HARDWARE

I am contemplating upgrading my A500 to Workbench 3.1, changing my printer to a Canon BJC600, getting a decent monitor and fitting an accelerator to use the machine for DTP. Is there any way I can modify the machine to read Zorro II or III cards so I can fit a 24-bit expansion card? I am aware the electronics involved is quite complex, or is this a case of complete upgrade?

Morris Jones
Thornaby, Cleveland

The sort of upgrade you're asking about is far beyond what could be done with the A500. Zorro II is possible (indeed, such an expansion used to be produced, but it died a death); Zorro III is much faster and intended for bigger processors such as the 68030/40. For the sort of money you're thinking about spending you'd be much better off buying a new A4000/30 which has much faster graphics and a far better CPU. (I know of a Workbench 2-based A1500 for sale in your area, see Chris in the Middlesbrough branch of Maplin Electronics. Such a machine is easily upgradeable and there are many more options for it.) ***Mark***

GOING INTO BUSINESS

HARDWARE

I am going to use my A4000/030 (2+8Mb, 80HD) as the basis for a business venture and would much appreciate your help. The Amiga will need to be connected to three chained SCSI devices: a flatbed scanner; a large external hard disk; and a removable storage disk of some kind, probably an optical disk or SyQuest. Can I simply connect the above devices and set their SCSI IDs, or do I have to remove some resistors?

I want to treat the removable media as a PC format device. Commodore gives an example in the Workbench 3 manual of altering the mountlist for CrossDos to do this for a SyQuest. If the manufacturer does not provide Amiga drivers, could I easily design a new mountlist entry for another SCSI device like a 1.3Gb optical disk? Are there any good books on this subject?

What Amiga software drives SCSI scanners? I'm interested in the Epson GT-6500, and especially the HP Scanjet IIcx. What software is best for cleaning up large, 16-greys scans?

Lastly, does ProPage 4.1 give reasonable WYSIWYG of large scanned images (A4, 300 dpi, 16-greys) on a 640 by 512 16 colour screen so that I can get a good representation of what my final output will look like? I don't want to resort

to graphics boards or slow 256-colour AGA. Is ProPage capable of dealing with black and white A4 documents that contain well over 250Mb of scanned graphics data?

I know you are probably thinking at this point "Please go to your local Apple dealer straight away and get him to slap you around the head with a couple of PowerPCs", but there is method to this apparent madness.

Paul Field
London SW18

I'm not thinking that at all, although the DTP task you describe may need more memory than you currently have. We'll get to that in a bit, first SCSI.

You don't have a SCSI interface with the A4000, so your first stop is to buy one. There are various options, and the absolute best advice I can give you is to approach a single Amiga dealer to supply you with the SCSI card, the large external hard disk, and the removable storage device.

A reputable dealer will ask plenty of questions to ensure that he is supplying you with exactly what you need, and he will be able to help you with any installation problems you may have, including writing mountlists if necessary. When you buy from a reputable Amiga dealer you don't need good books on the subject.

Before spending your money, ask the dealer if he is prepared and able to provide you with this sort of after sales service – if he isn't, then shop elsewhere. Brian Fowler Computers (0392 499755) would be a good place to start.

One fact I should prepare you for is that to format a hard disk or removable disk as PC format you will require version 5 of CrossDos. The version which comes with the Amiga is an earlier version of CrossDos which can format floppies as PC disks, but that's all. However, if the removable media is already PC formatted (at work, by a friend...), the version of CrossDos which comes with the Amiga is fine for reading and writing to that media.

On to the second of your questions. The Epson GT scanners are the best supported flatbed scanners on the Amiga. Alas, there is no Amiga software which drives an Epson GT scanner via a SCSI interface, so you'll have to plug it into your parallel port. While this isn't quite as fast as driving it via SCSI, it works well.

However, if you want a printer plugged in as well you'll have to get a switch box or multiport card that is fully wired for bidirectional parallel data transfer. The best one-stop Amiga software for scanning and retouching scans is ImageFX. Many users prefer the ASDG scanning software that goes with ADPro, but ADPro is useless for retouching.

Now then. This is where we get to the possible memory problem I mentioned. For greater processing accuracy, image processing and flatbed scanning software will hold greyscale data internally in 8-bit format, even though you may be displaying it in 16 greys. A 300 dpi A4 scan will be around 2500 by 3500 pixels; at 8 bits per pixel this calculates to 70 million bits of memory required to store the image data, which is approximately 8.5Mb.

As you have just 8Mb of expansion memory, there is no way you are going to be able to scan (or load) such a large image unless you use virtual memory. ImageFX has built-in virtual memory support – it's data caching really, which doesn't require an MMU so will work on the A4000/030 – but you'll find that while you may be able to accept the decreased scanning speed, it will be frustratingly slow to work with when retouching. Your only realistic options are to buy more memory (another 8Mb to be comfortable) or to scan at a lower resolution.

Now ProPage. When run in 16-colour mode, ProPage 4.1 reserves just four greys for displaying coloured and greyscale bitmaps – that's black, white and two shades of grey. The other 12 colours are reserved for the user interface and for displaying structured drawings and fonts in colours. This 4-greys representation is normally good enough to see what the bitmap is and to position it or put words on top of it or whatever, but it is certainly not WYSIWYG.

You cannot really blame ProPage, it is a simple limitation of working on a 16-colour screen. If you want a better WYSIWYG display then you can flip to 256-colour mode, then flip back to black and white or 16 colours to continue work.

For display purposes, ProPage holds bitmap data internally in only as many bitplanes as the screen mode. So in 16-colour mode your single 300 dpi A4 scan will consume about 4Mb of memory. I don't know where you get your figure of "250Mb of scanned graphics data" — keep in mind that a bitmap's filesize bears no relation to the memory it will consume; that's decided by the depth and pixel dimensions of the bitmap – but if we say you want 10 different A4 300 dpi scans in the document, then you will require about 40Mb of memory to hold them all in RAM.

Naturally this is asking too much, so you will have to keep all the graphics "hidden" — which means you will load and position them one at a time, but before loading the next one you will first "unload" the previous graphic so that ProPage can free the memory that graphic is consuming. On the screen you will get a rectangle with a cross through it. Naturally you may reload the graphic at any time, provided you have enough free memory of course.

At print time you may require even more memory because the real bitmaps (as opposed to the quick display representations) are loaded into memory again from disk. Printing in Greyscale mode will use 4 bits per pixel (for the whole page, not just for bitmaps), printing in Colour mode will use 12 bits per pixel. ProPage 4.1 has a feature which enables printer data for bitmaps to be cached temporarily to hard disk, which will enable you to print the kinds of massive bitmaps you want to work with without having to buy megabucks of memory, but you may find that this cache will need to be set to 50Mb or more if there are many large bitmaps on your pages.

Naturally you must first ensure that at least this amount of free space is available on the hard disk. This is for "preferences" printing by the way – printing to a dot matrix printer using a Workbench printer driver. If you are outputting to a PostScript device you will not require a lot of memory in the Amiga for printing as the pages are imaged in the printer's memory, not in the Amiga's memory.

So you see the platform you are using is only a small part of the solution. The A4000/030 is just as capable of doing what you want to do as is a PowerPC, though not as quickly without some speed-up hardware, but the bottom line, as it is on *any* platform, is memory and storage space. ***Jeff***

IBM MONITOR TO AMIGA?



I have an old IBM XT computer which I use to receive weather fax information. It has an IBM 5153 CGA colour monitor connected and I was wondering if I could use this monitor with my Amiga 500 instead of the A520 modulator/TV setup I currently use?

If so, what would be the connections to the Amiga's RGB output? I have no idea what each of the leads on the existing IBM 9 way 'D' connector do but the pinouts are as follows:

1:Green,	**2:Black,**
3:Red,	**4:Violet,**
5:Blue,	**6:Yellow,**
7:Blank,	**8:Orange,**
9:White.	

Alternatively, if you know of any Amiga fax software I could lose the IBM doorstop altogether.

Alan Collier
Plymouth

I'm pretty sure that you won't be able to connect your A500 to the IBM 5153, unless you have a flicker-fixer installed in the 500, because it is likely that the monitor will run at a higher frequency than your Amiga can provide (hence the need for a flicker-fixer/scan-doubler). Even if you did manage to connect it, you would probably only get a maximum of 16 colours on screen.

Incidentally, the colour of the connection wires aren't much use to me – I'd rather know whether the connections are RGB, where the sync signal is injected etc. But since you don't have this information, and I don't either, then we're rather stuck.

There certainly are fax programs for the Amiga, though which variety you get depends on the modem you have (which you don't mention). The program I use with my Supra v32 FaxModem is GPFax, which you can get from First Computers in Leeds for around £50.00. It works pretty well for me, but you do need to get a version which is compatible with your modem. There is also at least one PD fax program but I've never heard of anyone having any success with it so I won't tantalise you with further details.

In the end you may have to buy a new modem, along with suitable Amiga fax software, before you can finally dump your old IBM. ***Gary***

UPGRADE ANGST



I have an A1500 and want to upgrade to an AGA machine. Keeping in mind the present situation with Commodore, I don't know what to do. Should I go for an AGA Amiga, or should I go for a PC compatible? And why? If you favour an AGA Amiga, would you recommend an A1200 or an A4000, keeping in mind that I may want to make my system PC compatible?

Kamal Akhtar
Faisalbad, Pakistan

Simple decision. If you want an Amiga, buy an Amiga. (Why? Because that's what you want). If you want a PC, buy a PC. (Why? Because that's what you want.) If you want an Amiga and a PC, then either buy both, or buy an A4000 and Emplant – always assuming the Emplant IBM module actually arrivezzzzzzz... ***Jeff***

SNAKE BITE



I enclose a copy of a letter I have sent to Power Computing regarding problems with the Viper Accelerator board. Do to the fact this is a very expensive piece of hardware with good overall ratings and from a highly respected company, I thought you might like to comment on these problems.

Ricardo Jorge Ribeiro Aguiar
Maderia, Portugal

We don't have the space to reproduce Ricardo's

epistle in its entirety here, but the general drift surrounds problems with the 28MHz version plus 50MHz 6882 and 8Mb RAM. At £600, Ricardo was right to complain since this is an extremely expensive piece of kit. However, I can only comment on the review model we were sent for test and this did not exhibit any of the problems mentioned; apart from the physical ones mentioned in the review and these are more due to individual A1200s than the expansions themselves.

It appears Ricardo has got a "Monday morning" board and Power assure me they are treating the matter with some urgency. Since Ricardo's father bought the board in the UK, the contract would come under the UK "Sale of goods act" and under this he in entitled to a full refund or replacement. Personally, I'd opt for the replacement though: the Viper 28 represents excellent value for money and my original comments stand. ***Mark***

MORE POWER TO YOUR CLOCK?

My A1200 is fitted with a Prima RTC module, GVP A1230 and 4Mb RAM. Since fitting the A1230, the machine refuses to recognise the Prima. I have written to GVP and they suggest, the power supply may be at fault and one of larger capacity may be in order. Could I use the PSU from an A500?

Evan Morris
Ripley, Surrey

Whoever gave you that sort of answer obviously does not know the first thing about the machine and has no business handing out advice. It strikes me, you didn't get it from GVP in the States, but from one of their European distributors: no names, no pack drill: they know who I mean and they ought to be the first against the wall when the revolution comes.

Last time I looked at an A1230, it had a RTC all of its own and I suspect the real problem is that the Prima and A1230 are clashing with each other: I haven't been able to find a machine with a Prima fitted to test this. I'd suggest you remove it and check the clock program again – at least that way you should be able to identify the culprit – it certainly is not the power supply. Power supplies are blamed for a variety of problems and, although not entirely without problems, are more maligned that real figures suggest they deserve. ***Mark***

WHERE ART THOU, 68010?

I read in an old issue of *Amiga Shopper* that the 68010 could be used as a pin-for-pin replacement for the standard 68000 to gain a small speed improvement. I don't want to go to the expense of a large upgrade since I wish to change the machine quite soon, but this upgrade was appealing. However, try as I might, I cannot find anyone locally or otherwise who stocks this particular device. Can you help?

P. O'Neill
Halesowen, West Midlands

The 68010 is like rocking horse droppings: proverbial and about as much practical use too. The most notable change for the 68010 was a single instruction moved to Supervisor status and precious little else. The actual speed improvement is measurable, but barely noticeable – you'll just convince yourself it works. More importantly, a lot of software will not work because of the design change. (Some pundits have suggested the 68010 was a bug fixed version of the 68000, it depends who you listen to.)

Personally, I wouldn't waste time or money on this "side-grade" because it may make your machine less attractive to games players when you come to sell it. If you're determined to get one, you could try a local electronics dealer: most will be able to order you one from the trade firm, Radio Spares (aka RS) whose name for high quality is only matched by its premium prices. ***Mark***

HIGH DENSITY BOOT

Some time ago, I bought a KCS HD2, dual high-density drive as reviewed in the January issue. This is all you said it was, but I wonder if you can tell me:

1. When is the long-awaited software upgrade coming?

2. How can I boot from high-density disks?

3. Is it possible that the drives may be out of alignment? I seem to be getting a lot of disk read errors recently? If so, do you know of any diagnostic software to periodically check for such errors.

4. Would the KCS Power PC emulator be a good buy?

5. Can you tell me why the DOS error messages invariably insist on a RETRY when you click the CANCEL gadget?

Robert Atkinson
Evie, Orkney

As the reviewer responsible, I'm glad you found the comments accurate – but I'm sad to hear you've had problems.

1. Pass. At the time of writing I have not heard anything either and KCS have been unusually quiet – a calm before the storm perhaps. Also, KCS head honcho, Krijn Kolff finally became a proud father earlier this year, so that may explain it too! I have raised your comments with Bitcon Devices (I'm sure you're not the only person eagerly awaiting the upgrade) and they suggest it should be available by the time you read this!

2. You can't at present. This would require a special resident program which was promised as part of the upgrade package. I doubt it will ever be possible to cold-boot from an HD; this privilege is probably going to remain a job for hard disks.

3. My personal experience of HD disks suggests this more likely to be faulty media (cheap disks?) than a fault with the drive. My Macintosh regularly refuses to format HD disks which appear to work fine on the Amiga and this suggests the Amiga's hardware-level error checking is lacking in some way. I have also noticed, that HD disks seem to suffer with a shorter use-span and have a much higher failure rate. I should emphasise, this is my personal experience and serious testing would be needed to check the hypothesis. (It's worth noting here, most machines sporting an HD format also employ hard drives, so the floppy disks get much less use: cause for concern methinks.)

4. Yes. But they are increasingly in short supply since KCS ceased production. You might still be able to get one second-hand though and it remains the most usable PC emulator for smaller machines. (At the time of writing, Bitcon Devices have a very limited supply of A500 models left at a reduced price.)

5. This seems to be some curious pathology hidden deep in AmigaDOS (more accurately, the trackdisk device). I discovered this when writing FMU (available from CIX and other PD sources). The request cannot be overridden in software unless you stop all requests appearing. There's a "feature" (OK, a bug) in FMU's "NOREQ" switch which effectively prevents these requesters appearing at all! It's rather like cracking a peanut with a sledgehammer, but it works in dire situations. ***Mark***

I WANT MY (M)TV!

I recently purchased a Microvitec 1438 monitor as a replacement for the TV which I used to use with my Amiga.

The display is much better but now I can't watch TV! If I purchased a video recorder would I be able to connect it to my 1438 and watch TV (and videos)?

Joseph Robinson
Lymington, Hampshire

Bad news Joseph – since the 1438 has only analogue RGB input then it isn't possible to connect a VCR to it without the addition of a PAL decoder.

Which, in practical terms for you, means that you'll probably have to get a another TV. ***Gary***

TINY MIND BLOWN

My PowerScan 3 uses all the available memory in my A500 (2.5Mb total) and I have no trouble when it comes to manipulating the images. However, when I load the scanned images into Deluxe Paint II I keep getting "Out Of Memory" messages.

Is there any paint package (preferably one including some basic image processing) which uses fast RAM instead of only Chip RAM? Or is there any software available that can be used with DPaint to make it use fast RAM?

N. Wood
Rickmansworth, Herts

I think you'll find that Deluxe Paint II (like almost every well written program) uses any memory it can get its pixels on – which means both Chip and fast RAM.

My best guess at solving your problem is that either your RAM could be faulty or that your images are just too big to display successfully with DPaint and your current memory. Remember that DPaint also needs RAM to run, and it is unlikely that your Amiga will have less free memory after DPaint has loaded than when you were running the PowerScan software.

Otherwise, there should be no problems. Years ago, when I was running DPaint II on a 1.5Mb Amiga 1000 I could still produce 70 or 80 frames of hires interlaced animation in up to 8 colours, though often I would run out of memory and have to split an animation into several parts.

The solution? – either add yet more memory, or continue to work within the frustrating limitations of your current Amiga setup. ***Gary***

MORE RAM TO YOUR ELBOW

In *Amiga Shopper 27*, you featured an article on how to modify the motherboard to enable Agnes to use the internal expansion as CHIP memory rather than FAST.

If I were to do this would I still be able to add a further 8Mb of FAST memory to the external bus on my A500? I don't have the ability to try this myself, so I'd appreciate some hints on

where to go.

Dave Taub
Norwich

The simple answer is yes. Once Agnes is re-configured to read the extra RAM as CHIP, any extra memory you add will be read as FAST. The Agnes fitted to your machine has an upper limit of 1Mb only and the external bus is only addressed as FAST memory.

A local dealer should be able to do this for you provided they have a repair department but I can't tell you how much they would charge – I suggest you shop around. Many of the firms advertising in both *Amiga Shopper* and *Amiga Format* will be able to do the modification for you – but it won't be cheap no matter where you go. ***Mark***

HERE WE GO AGAIN...

I've acquired a Zenith Data Systems 11 inch green screen monitor from my old school. All I want to know (surprise surprise) is whether I can connect it to the composite video output of my A500 Plus and my Philips 7300 TV tuner? The monitor is 1986 vintage and made in Taiwan.

Michael Clark
Sidcup, Kent

You mention that the monitor has a phono video input. This is encouraging. Have you tried connecting your Amiga's composite output to it? If not, do so, because you'll soon find out whether it will work or not. Of course you won't get much of a display – just black and green – but if this is how you want to view your Amiga and TV displays then go ahead.

Other than that, I'm not going to bother wasting my time trying to find out anything else about this monitor because it really isn't going to help you very much when it comes to anything but basic word-processing. Have you ever tried to paint in colour on a black and white TV? Well, that's about the level of fun you're going to get.

Personally, I'd recommend you forget the Zenith (whether it works or not) and stick with the Philips 8833 monitor which you already have. ***Gary***

JUMBLED TEXT

When I boot my machine from hard drive and try to read text files, the message "attempting to load C/MMPP" flashes on the Workbench title bar. After which, I get a bunch of jumbled letters on the screen followed by a bunch of jumbled symbols. However, when I boot from floppy disk and attempt the same thing, the text is clearly displayed. I have the MMPP program on the C directory of my hard drive.

Alan Gravener
Denton, Manchester

I'm not familiar with MMPP: but the problem sounds like a bug in the program that assumes a certain library can be found and does not report it missing. Whatever it is, there's something on your Workbench disk that MMPP needs that is not present on your hard disk. Assuming you have the same versions of Workbench on floppy and hard disk you could use the following (sledgehammer) method to fix the problem once and for all.

1. Boot from hard drive and open a Shell.
2. Insert your boot floppy in the internal drive.
3. Enter the following commands:

```
PROTECT S:St#? D SUB
PROTECT LIBS:#? D SUB
PROTECT L:#? D SUB
COPY FROM DF0: TO SYS: ALL
```

You'll get some messages during the COPY telling you certain files cannot be overwritten but this is normal: it's unwise to overwrite things like the startup-sequence on a hard drive with one from a floppy disk, but this should fix the problem. ***Mark*** AS

FILL IN AND GET US TO ANSWER YOUR QUESTIONS

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please, also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. **If you have *several* questions in different fields that should be addressed to more than one of our experts, please send in your queries on *separate* forms.**

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Your machine:

A500 ☐ **A500 Plus** ☐ **A600** ☐ **A1000** ☐ **A1200** ☐
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Approximate age of machine: __________

Kickstart version (displayed at the "Insert Workbench" prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐ **3.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.04/2.05** ☐ **2.1** ☐ **3.0** ☐

PCB revision (if known). Do not take your machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for Workbench 1.3) __________

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5in/5.25in) as DF__: Manufacturer __________

Extra drive #2 (3.5in/5.25in) as DF__: Manufacturer __________

Hard disk: ____Mb as DH__: Manufacturer __________

Extra RAM fitted – type, size in Mb and manufacturer __________

Details of any other hardware which could help us to answer your question:

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

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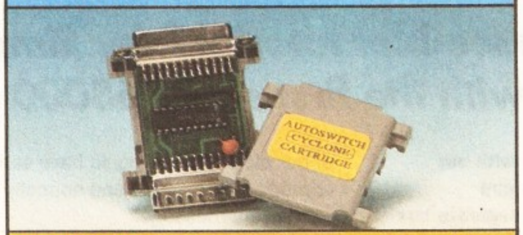


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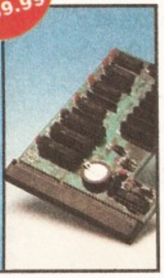


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Assembler PART 2

In this month's Assembler tutorial Toby Simpson is going to get into some coding and deal with the first set of 68000 assembly language instructions.

Hopefully we're all kitted out with our Developer Upgrade Kit 3.1s and Assemblers. If not, see the separate box on how to get hold of these bits. We've covered the difference between machine code and assembly language. Assembly language is effectively a user-friendly method of programming machine code, a program called an Assembler converts each line of assembly language into its appropriate machine code instruction. As we found out, this differs from compiled languages such as 'C', where one line of C code may generate many machine code instructions.

Our reasons for programming assembly language are for control, and speed, as we know exactly what code the microprocessor in the computer is going to be running, rather than let a compiler choose for you. We call the assembly language program we have written "The Source Code", and the machine code file which is generated is the "Object Code".We introduced two 68000 instructions last time, 'add' and 'move', to help illustrate the relationship between assembly language and machine code.

As you will recall, we can use the add instruction to add values to something else, such as a register, or a memory location. The move instruction is for moving data from one place to another. With these two alone, and one other, we can write our first assembly language program and run it. So, what's our new instruction then?

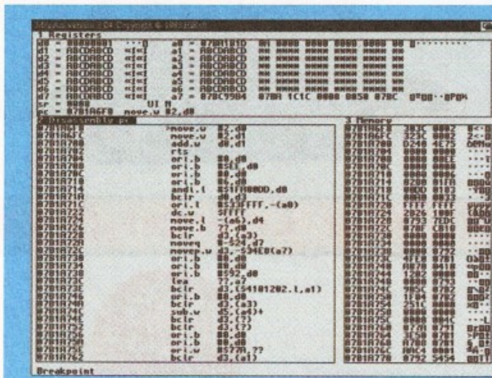
RTS stands for "Return from Subroutine". We will use this as the last instruction in our program, so that when the processor has finished running our program, it can return to the point from which it was called. If we left our program "open ended" and did not terminate it, then the 68000 Chip would continue its fetch and execute cycles, working its way through the memory after the end of our program. This could have seriously unpredictable results, and normally ends in a crash with a guru message.

Machine code is simple – unless you tell it to stop at the end, it won't. Of course, there is a 68000 instruction which we could use to simply halt the processor at the end, but that would be useless for us. Why? Because it's not just your program which is running on the Amiga, there is a master program called the operating system which is controlling your machine, and it is this program which loads and runs yours. Unless you finish your program with the appropriate operation, in our case rts, then it won't know it's finished. We'll visit rts again in a while, but in the meanwhile accept that it has to go at the end. Let's knock up a small program. Type this into DevPac exactly as shown:

```
move  #2,d0
move  #2,d1
add   d0,d1
rts
```

Once you have typed this in, you need to assemble it. On DevPac, assemble to memory. To run the program with the debugger, select Debug from the program menu, rather than Run. You'll then be faced with a display rather like Picture 1. A whole bunch of confusing information there, but what's relevant to us is window 2, "Disassembly PC". You'll notice that the first four instructions look mighty familiar. Indeed, this is our program. You can see exactly what the Assembler has converted it into in window 3.

Window 1 tells us what each one of the registers is currently holding. Note that our two moves and add have had the .w added to the end of them, showing that the instruction is working only in 16 bits. In 68000 assembly language, if you omit a size specifier, such as .b for byte, .w for word and .l for long, then .w is assumed



Our first assembly language program, assembled and ready to rock and roll!

automatically. It's good practice to always specify a size, so we will in future. It was omitted from the above example for clarity reasons.

OK, so let's run it. In M o n debugger), we can run one instruction by holding down the Control key and tapping T. This has the effect of executing the first instruction. Looking at Window 1, the register list, you'll now notice that the .w part of d0, the righter most 16 bits, now contains "0002". Devpac shows this information in Hexadecimal. This means that our first instruction executed OK. Now pressing CTRL-T again, the same happens but for d1. Pressing it a third time will execute the add instruction, which adds the .w part of d0 to the .w part of d1. The result, in d1, is of course 4, since we've just added 2 to 2. That wasn't hard was it?

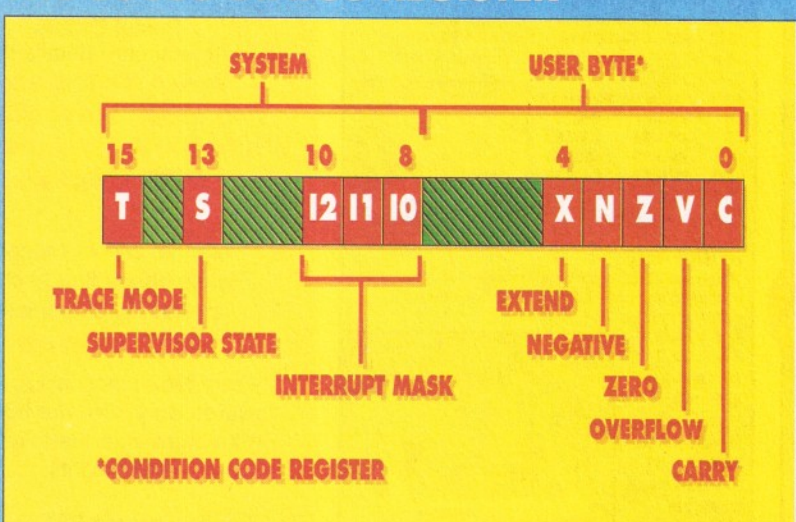
CTRL-T once more will execute the RTS instruction, and our program will quit and the DevPac screen should pop back to the front.Granted, we have not exactly written a major application, but we have managed to get a small program written, and working. Let's try something a little more advanced. Above we used our registers to store values in. We are not limited to just the registers inside the microprocessor, there is of course rather a large amount of memory inside your computer which can just as easily be used to store information in. For example:

```
move.w   $50000,d0
move.w   $50002,d1
add.w    d0,d1
rts
```

If we omit the # symbol, which means a literal value, then the Assembler will assume we were referring to a memory location. Since the dollar symbol $ is used to denote hexadecimal numbers in 68000, the first instruction in the above program moves a word of memory from byte location $50000 and $50001 (each numbered memory location stores one byte, so a word requires two memory locations) into d0.

So, if 50000 contained $12 and 50001 contained $34, the result would be d0.w containing $1234. We then move the word from 50002 into

THE 68000 STATUS REGISTER



The 68000 Status Register is the place where interrupts and the rsults of the last operation are stashed. You can only get at the status Register if you are running in supervisor mode.

d1, and add the two together. Simple stuff, but there's a problem. We're referring to absolute direct addresses. This means that we need to guarantee that the memory at 50000 is free for us to use. This is next to impossible on a complex machine such as the Amiga, which multi-tasks; meaning that a program can never guarantee where it will be loaded in memory, or what memory will be free at any one time.

So, referring to absolute addresses like this is bad. What's the work around? Well, there's a couple. The first is to make the assembler do the work for us. Type this program into DevPac:

```
move.w   location1,d0
move.w   location2,d1
add.w    d0,d1
rts
location1:  dc.w 4
location2:  dc.w 2
```

So, what exactly have we done here? Well, we've introduced something new, the dc.w directive. dc.w is not an assembly language command, instead it's something special which the assembler understands. It stands for "Define Constant".

In this case, we are defining two word length constants, which we can refer to as location1 and location2, and we are putting 4 into one and 2 into the other. Since we have absolute control here, we know that location 1 and 2 are going to be in the four bytes following our rts instruction (2 bytes a piece). But the cool thing is that we don't have to know the actual hexadecimal memory location of location 1 and 2, as the assembler will substitute the correct addresses into our program when it assembles it.

OK, so let's do just that. We refer to these as labels, names which refer to specific memory locations. Assemble it and select Debug again. You'll be able to see our program again, but note that the machine code program now has substituted full addresses into the program. Since addresses are listed down the left hand side of window 2, you should be able to locate them, and, no surprises, one is in the word following the RTS, and the other is in the word after that.

LISTING A

The symbol ☛ means do not type a return – keep typing to the end of the next line. ▼☛ means type a space, then keep typing to the end of the next line.

```
  move.w   #2,d0
  move.w   #2,d1
  cmp.w    d0,d1
  beq they_were_equal
  rts

  they_were_equal:☛
  add.w d0,d1
  rts
```

LISTING B

```
  move.w   #$0000,d0
  move.w   #$0000,d1
  lea exam_results,a0
add_loop:   move.w (a0),d2
  cmp.w #-1,d2
  beq got_them_all

  add.w d2,d0
  add.w #1,d1
  add.w #2,a0
  bra add_loop
got_them_all:  divu
  d1,d0
  rts
  exam_results:dc.w 20,80,56,87,45,☛
98,23,32,79,-1
```

SOFTWARE TO GET STARTED!

You'll need a couple of things to make a start in the *Amiga Shopper* Assembler course, the first is last month's issue. It's worth getting, as part one of the course covers the basic groundwork for assembly language programming. But, for those of you wishing to make a start from here, you'll need an Assembler, a Machine code Monitor program, and the Amiga includes and autodoc files on disk.

Commercial assemblers such as DevPac come complete with the include files, although the full set of disks from Commodore have many more things, including full documentation on every Library call, and stacks of other files and example code. This is obtainable from Commodore directly. If you're interested, send a cheque made payable to "Commodore Business Machines (UK) Ltd." for 23 pounds to:

Sharon McGuffie
Commodore Business Machines (UK) Ltd.,
Commodore House,
The Switchback,
Gardner Road, Maidenhead,
Berks, SL6 7XA

Include a covering letter explaining that the cheque is for the "3.1 Amiga Developers Upgrade". If you're serious about Amiga development, you might also like to enquire about becoming a registered developer at the same time.

The assembler recommended for this course is Hisoft's excellent DevPac 3. We've used it throughout this course as it's by far the best package for beginners. There are other packages available, and some excellent Public Domain (Free) Assemblers, but DevPac is a fully integrated package with an excellent manual. If you do use an alternative Assembler and monitor program you will need to consult the appropriate documentation.

If you run the program step by step, you'll see that d0 and d1 will read in the 4 and 2, which are stored there, and produce the result 6 in d1.

DECISIONS AND LOOPS

In the first part of this course we discussed the things which make up a programming language, and came up with three basic ingredients: Sequence, Decision and Iteration. That is;

Sequence – the ability to run through a sequence of instructions one by one.

Decision – the ability to process information and then make a decision according to the result.

Iteration – the ability to perform loops.

So far we've dealt with only the first of these, sequence. Although you could write quite a complex program using sequence alone, it is not going to actually do very much as it will be incapable of making any decisions along the way.

Decisions in any programming language normally take the form of "If something has happened, do this". Take this little example, in C:

```
number = 2if (number > 1) printf("That number
was greater than 1");
```

You don't need to be a C programmer to see what is happening there. We are assigning the value 2 to a memory location which we'll refer to as "number" and then comparing it with 1 and performing an operation if the result is greater, which in this case it is.

We have an instruction like this in 68000, the cmp (Compare) instruction. It allows us to compare one numeric value with another, and perform an action according to the result. Let's put this into practice, and introduce our first loop at the same time:

```
move.w    #$0000,d0loop:
add.w     #$0001,d0
cmp.w     #$000a,d0
bne
loop
rts
```

OK, this is a lot simpler that it looks. There are two new instructions here, and a new usage of labels. Let's take it step by step. Firstly we clear the .w part of d0. Then we add the literal value 1 to it. Then we use the CMP instruction to compare the .w part of d0 to the literal value #$000a (which in decimal is 10). Then it's new instruction number 2, which stands for "branch if not equal". OK, so first time around d0 is 1, which is not equal to 10, so we branch back to the label loop and go again.

Eventually, d0 will become 10, and the bne will not happen, and the program will end. By tracing through this using CTRL-T in MonAm, you'll be able to see the contents of d0 gradually rise until it reaches 10. Processor Status Register. I told a little lie when I said bne is "branch if not equal", it's actually "branch if not equal to zero". I'm about to confuse you, but don't worry. For the sake of the cmp instruction, bne *does* mean branch if not equal.

To understand this a little better we have to look at how the cmp instruction works. After it has completed the comparison, it sets some processor flags, in a special register inside the 68000 called the SR, Status Register. This register contains a whole bunch of individual bits which are used to store the result of a previous operation. The Z bit is the "Zero" bit. CMP uses this to indicate if the comparison succeeded, but it's more than that, as other bits are also set by CMP so that we can check if the result was greater than, less than, or equal, etc. These instructions are just as easy to use, for example, we could replace the current cmp and bne in the above program with this:

```
cmp.w    #$000a,d0
blt
loop
```

Which now compares d0 to 10 and says "OK, if d0 is LESS THAN (lt) 10 go back to loop". Other

BLITS BOBS

If you watch Terminator 1, you may notice reams and reams of data fly past on the screen. Closer examination by square people such as myself revealed that this was in fact 6502 assembly language. This is to say that not only did Terminator have the same 8-bit processor as the old Apple II, or Atari 2600 games system, but it was useless data anyway, as it was commented source code flying around, not even executable data! Sad, but true.

instructions affect processor status flags in different ways, but they can be used to make programs shorter and faster. We'll look at some of these effects later on in the course.

BACK TO BRANCHING

The branch instruction is used to go from one location, and start running the program from another. We used it above in a simple loop. We refer to the many different branch instructions by starting with a B and then adding a two letter code to indicate how the branch is to happen. We have demonstrated two of these, bne and blt. Let's have a look at some others:

bra - This is a very useful version of branch, it stands for "Branch Always". We can use this to move directly to another part of the program without any condition.

beq - Branch if equal to zero. This actually tests the Z flag in the SR, and if it is set, then this branch will succeed. In the case of the CMP instruction, beq means "Branch if equal to"See listing A for an example.

This program only adds the two numbers together if they are equal to each other. In this case, since we're starting with known values, 2 and 2, we know for a fact that they are going to match, so the program will branch to the label "they_were_equal", and they will be added together, leaving 4 in d1 before the program quits.

Let's close this month's course by writing a small program which reads in a list of percentage exam marks from a class of children, and calculates the average. We'll use instructions we have already learnt, and a couple of new ones too:see listing B

Again, this is simpler than it looks. Calculating averages is easy, you simply add all the values together and divide by the number of values you used. So, we are putting our exam results at the memory location exam_results onwards.

We put the value -1 at the end of the list so that the program can know when it has read in all of the values. Whilst we are reading the values in, we're keeping a running total, and also counting how many values we have used. Then, when we have them all, we divide one by the other and can view the result in d0. But, there are some new concepts here. For the first time we have used an address register, and the lea instruction. LEA means "Load effective address". After the LEA line has been run by the microprocessor, a0 will contain the actual memory address of the label exam_results.

Then, in the line after, we use this instruction:

```
move.w   (a0),d2
```

This means "Move the word held in the address POINTED TO by a0 into d2". Since a0 points to the first exam result, 20, then 20 is read into d2. Then we have our little check to see if it was a -1. If not, we add it to the total, increment our value counter, and add 2 to a0. Why?

So that a0 now points to the next word in memory after the first exam result, which will contain "80", the next result. We added 2 because we are reading in word values, each of which takes 2 bytes. When the entire operation is complete, we use the divu instruction, which if you have not already guessed is "Divide". It is actually "Divide Unsigned".

After the divide is complete, the word part of d0 contains the final average, and the other word in d0 will contain the remainder – a useful side effect of DIVU. You'll notice that we have now introduced three ways of referring to data, immediate literal values, such as:

```
move.w   #10,d0Contents of addresses:
move.w   memory_location,d0
```

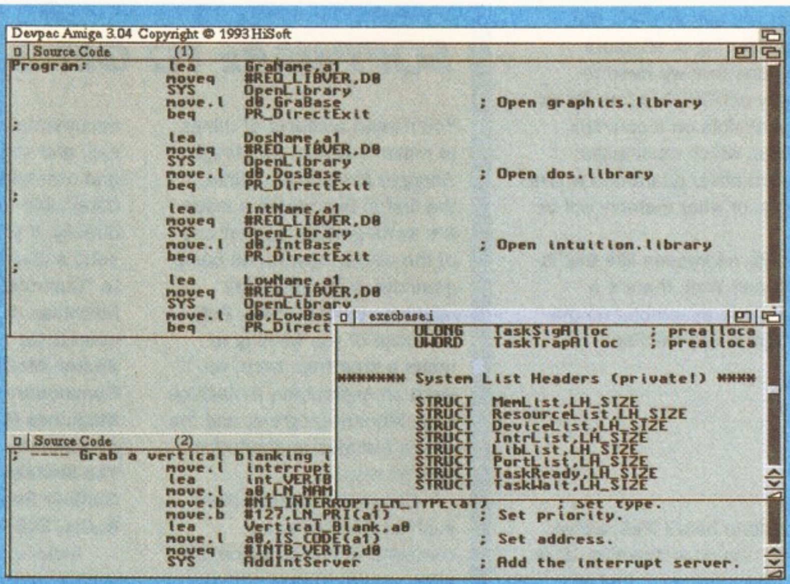
And indirect contents of addresses:

```
move.w   (a0),d0
```

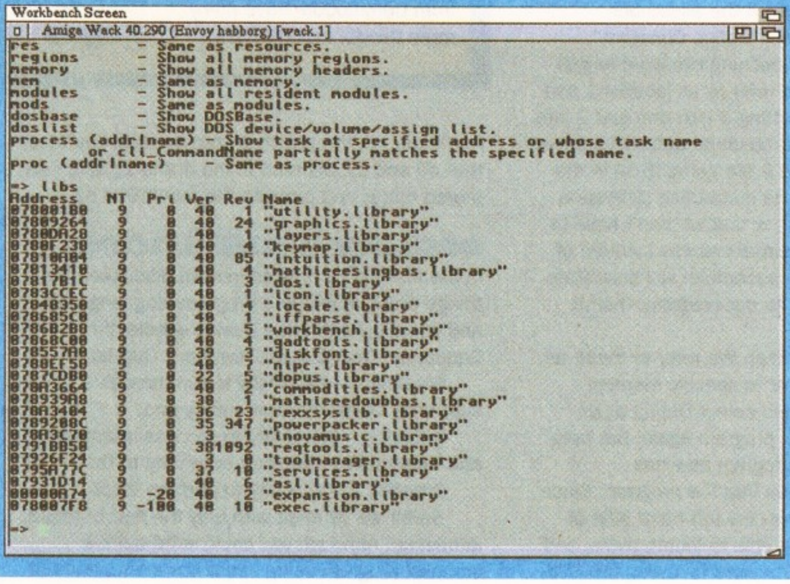
These methods of referring to data are called "Addressing Modes". The 68000 has quite a lot of them, and as we learn how to use some of the more complex ones, you'll realise that the average result program we have used could be much smaller and more efficient; we could optimise it so that it is better. (Readers out there with some experience already may have already thought "Hang on, I could do *that* better!")

Next month we'll introduce subroutines, and some of the concepts which come with them, plus we will look at a wider range of addressing modes and instructions.

In the meanwhile, happy coding! AS



A more complex program under development, showing multiple windows in DevPac, allowing you to view many parts of a program at once.



Debugging with a particularly nice toy from Commodore (ROMWack), allowing debugging over a serial link

JARGON BUSTING

Source Code – Assembler code in a form which can be read by humans

Object code – Assembler code in a form which can be read and processed by your Amiga.

RTS – Return From Subroutine. The final instruction of any program, which returns control back from the program to the operating system.

– Defines a number as a literal number. If there is no hash sign in fromt of a number, it is assumed to be a memory location.

$ – Defines a number as a hexadecimal number.If a number has no prefix, it is assumed to be a normal base 10 number.

Toby - A nice bloke

WHAT
DevPac 3
WHO
DevPac 3: Assembler for the AmigaHiSoft – £69.95, plus £2.00 postage.
WHERE
HiSoft ☎ 0525 718181

Deal Direct, with Digital Direct...

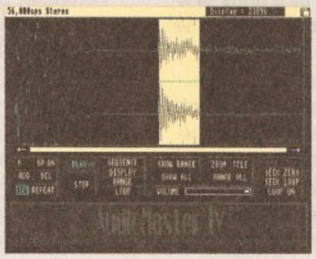
Music Samplers etc.

Megalosound is the new 8-bit, stereo, direct-to-disk sampler package; the software is packed full of easy-to-use editing features, special effects and extras such as the ability to print waveforms and sample information.

The package allows sampling up to 84KHz mono and 56KHz stereo to memory and up to 21KHz stereo to hard disk on an A1200. Supplied with a hardware volume control and an extensive 144-page manual, Megalosound is impressive value and Gold-rated by CU Amiga, with 89% from everybody's favourite magazine, Amiga Format!

ProMIDI Interface

The ideal MIDI interface for all Amigas, this smart-looking device comes with MIDI in, MIDI thru and two MIDI out ports and is complete with manual, software and a flying cable for convenient positioning.



AudioMaster IV is regarded as the de-facto standard in sound sampling and editing software. With its incredible range of features and clear, informative displays, it is hard to beat as a sound editing system.

AudioMaster IVis compatible with Megalosound and any other sound sampling hardware that connects through the Amiga's parallel port. Please call for further information.

Graphic Design

VistaLite 3.0

Create stunning landscapes with this amazing 3D simulation program. Supports HAM8 and 256 colour mode and requires 2Mb of RAM and Workbench 2.0 or above. A simply superb product from Virtual Reality Labs!



Distant Suns 5.0

Be the star of your own trek through space! Animate the solar system, view the same night sky as the 3 wise men and navigate by the stars with this 3D Desktop Planetarium. Requires 2Mb RAM and Workbench 2.04 or greater.

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Maxon Magic	£22	VistaLite 3.0	£29
TurboText	£39	Distant Suns 5.0	£29
VideoMaster A500/A500+	£39	SBase Personal 1.3n	£69
VideoMaster A600/A1200	£59	SBase Professional 1.3n	£139
ColourMaster with VideoMaster	£35	Remainders	
ColourMaster separately	£49	Power BASIC Amiga	£10
VideoStage Pro	£99	K-Spread2/K-Data Pack	£10
ProFlight	£10	(A500/A500+ only)	

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All goods are offered with a no-nonsense 30-day money-back guarantee, if you are not completely satisfied with the product.

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Video/Presentation

VideoMaster



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VideoMaster AGA works on the A1200 and A600, connects via the PCMCIA slot for extra speed and freedom to use other peripherals, allows high quality stereo sound and supports HAM6 and HAM8 up to 640 x 512 resolution for stills.

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VideoStage Pro

Spectacular video and on-screen interactive productions are easily created with this brand-new release from Oxxi. Shows can incorporate text, graphic objects, animated sequences and sound.

The *Storyboard* features icons for insertion of show events such as graphic images, title screens, sound events, ARexx calls, genlock events and play loop events; a *Timeline* allows different tracks for each of these.

Videostage Pro supports the concept of *Actors* allowing animation of any drawn object, button or brush and actors may be overlapped in their motion so that multiple objects move at the same time, for smoothness.

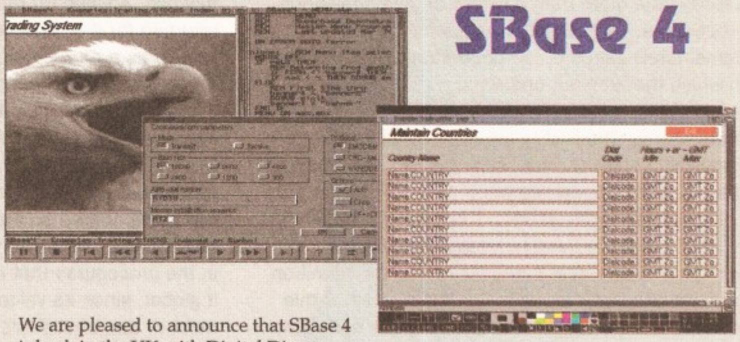
The *Genlock* control supports G-Lock and SuperGen genlocks as well as all generic Amiga genlock controls. *Sound* support for 8SVX samples and NoiseTracker, ProTracker and SoundTracker music modules.

Over 60 built-in dazzling *Special Effects* with wipes, fades, scrolls, cross-fades etc.

Videostage Pro requires an Amiga with a hard disk and 3Mb RAM (at least 1Mb chip RAM). AmigaDOS 2.0 or higher.

Business Applications

SBase 4



We are pleased to announce that SBase 4 is back in the UK with Digital Direct. SBase 4 Personal and SBase 4 Professional are up to version 1.3n now and we have both in stock, ready for immediate despatch.

These products are renowned for their power and their range of features and have been available on the Amiga platform for many years in earlier versions. Now they have both been brought right up-to-date with support for the very latest Amiga computers.

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Community CHESS

Cliff Ramshaw continues his guide to writing a chess program in C or AMOS, introducing the routines needed to get things moving.

The focus of this month's installment is on laying the foundations for our chess program. All the code here is straightforward, and shouldn't present any problems if you're at all used to programming.

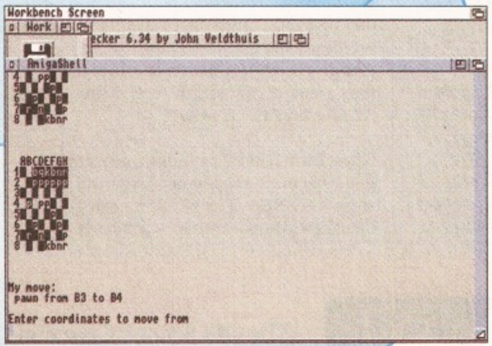
I've included versions in both C and AMOS. Don't ignore whichever is not applicable to you – a comparison of both versions can be quite revealing as to the differences between C and Basic.

The program's foundations consist of the initialisation stage, during which the major variables and data structures are assigned their starting values; the display or output stage, which draws the board after every move; a couple of support functions; and the main loop.

The concept of the main loop runs throughout just about every computer game there is, as well as many other kinds of application including spreadsheets, paint packages, word processors... The main loop is a section of the program, usually short, that executes repeatedly. It is entered after the initialisation stage, and continues until the program is terminated. Inside the loop there is usually little more than a series of calls to various procedures. By glancing at these lines you can immediately gain a broad understanding of the way in which the program operates.

Let's look at the initialisation. There's two parts to this. The first is the creation of certain important variables, the second is the setting up of the chess board, carried out in C by a function called setupboard(), in AMOS by SETUPBOARD.

In C, the first thing to happen (after the inclusion of the stdio.h header file) is the definition of a structure type called move. Structures of this kind are used throughout the program to carry data about moves under consideration, and the best move discovered so far by the computer. As you can see, they consist of a series of integers, representing the values of position on the board, direction to move in, distance to move in, the score attached to the move, and the kind of piece being moved. This kind of structure is impossible to create in AMOS. Instead, we've made do with an array called CURRENTMOVE. Each of its elements is equivalent to one of the components of the C structure, but has to be accessed by means of a numerical index rather than the meaningful name we can use in C.



It may not be the smartest of chess programs, but it can cause problems for a player like me.

The other variables are the same in both languages. By declaring them outside of and before the main program in C, and by explicit use of the GLOBAL keyword in AMOS, we've made them accessible by all procedures in the program.

The two-dimensional array board is used to hold the state of the board, while notmoved (NMOVED, in AMOS) is used to mark whether pieces on squares have already moved or are still in their starting positions. This comes in useful for checking for moves such as castling (the king cannot castle in chess if it has already moved) and can also be used to fine-tune the way the computer plays.

The names of the pieces are stored in a string array called pieces.The arrays values (WORTH in AMOS) and initials contain the point values of the pieces and their initials respectively. Note that a knight is represented by the initial "n", to avoid confusion with the king. Because of this, we can't just strip the first letter from the pieces array to retrieve the initials, but must store them separately. They're used for the board display.

In the C version, there now follows a list of function prototypes, or declarations. These tell the compiler which functions the main program is going to be calling on, what parameters they take and what, if any, results they will return.

Time to look at the main body of the program (as distinct from, though encompassing, the the main loop) in more depth. In C, a structure of the type move is declared, called computermove. This is used to hold the move chosen by the bestmove() function. A value (or rather, a set of values) is returned for it by bestmove(), and it is passed en masse as a parameter to the makemove() function, which physically alters the board accordingly.

An array called CURRENTMOVE is used as its equivalent in AMOS, but because the values for this can't be returned by the AMOS BESTMOVE procedure (only a single value can be returned) it has to be shared so that BESTMOVE can alter it directly. I've chosen to use the Shared statement in the procedures that need it, rather than making it global, since its value is of no consequence to most of the procedures in the program, and, for reasons of style, making things global should be avoided where possible.

The other variable used is ply, and the program's second job, after calling the setupboard() routine, is to ask the user and get a value for it. The number of 'ply' determines the number of moves ahead the computer looks (see the box-out for more details on the meaning of this). In the AMOS version, this request is preceded by the commands to set the background colour to white and the text colour to black, ready for displaying our board.

With these preliminaries out of the way, the main loop begins. In C this is enclosed by a do...while structure, in AMOS by Repeat...Until. Both are infinite loops. The condition after the while statement is always true (1), and the condition after the Until statement is always false (0), so the program loops continually. This means that it constantly makes a move then asks the player to make one – in other words, it doesn't, as yet, recognise the end of a game.

The first thing that happens in the loop is that the board is displayed by a simple call to drawboard(). Bestmove() is then called to pick the computer's best move from those available (the computer plays white, and so begins the game). The result of this is stored in computermove (or CURRENTMOVE in AMOS, though the fact that BESTMOVE affects this variable isn't so obvious here). The routine makemove() is then called to modify the board. Again, in C you can tell that the results of makemove() depend on computermove, since it forms the parameter to the function. It's not possible to pass CURRENTMOVE, it being an array, in AMOS, so MAKEMOVE has to share it.

The next two lines modify the notmoved (NMOVED) array, zeroing both the squares moved from and to, and keeping track of the fact that the piece in question has now in fact moved from its starting position. The x and y parts of the computermove structure (elements 0 and 1 in AMOS) contain the coordinates of the starting square. The dx and dy parts (2 and 3) the directions along x and y the piece is to move, and the distance part (element 4) the number of squares in the indicated direction. So by multiplying dx by distance and adding the result to x, we arrive at the x coordinate of the destination square.

ON THE MOVE

After this, the new board is again displayed by a call to drawboard(). The computer then prints out a text description of the move. It gives the name of the piece in question by accessing the pieces string array (which holds the name of each). The two halves of a coordinate pair are dealt with slightly differently. The x coordinate is to be represented as a letter, so it has a value of 65 added to it. This has the effect of converting a number 0 to the letter "A" (which has an ASCII code of 65), a 1 to "B", and so forth. The y coordinate is to be displayed as a number. Since the number "1" has an ASCII code of 49, all we need to do is add 49 on to the value of the y coordinate to gain the character we need.

Finally, before the loop closes, the program calls humanmove(), the function that accepts and makes the move selected by the human player.

Let's deal next with the xcoord() and ycoord() functions, both nice and simple. They're actually used by the humanmove() function solely, to convert the player's entries into the coordinate system internal to the program (which is to say, values of x and y between 0 and 7).

Xcoord() accepts a character in the range "A" to "H" and returns a value in the range 0 to 7. Because character and integer variables are interchangeable in C, we can do this simply by subtracting the ASCII code for "A", 65, from the character variable holding the x coordinate and returning the result. In AMOS, the string is first converted into an integer ASCII value by use of the Asc() function before 65 is subtracted.

The ycoord() function is similar, except that 49 is subtracted since it's dealing with characters in the range "1" to "8", with ASCII codes between 49 and 56, which need to be converted to numbers between 0 and 7.

Another simple, though longer, function is setupboard(). It operates on the board array, which is globally available. It begins by creating two

loops, one nested inside the other. These loops cycle through every x and y coordinate in turn, as the names of their indices suggest.

Each element of board is initially set to 0, and each element of notmoved (or NMOVED) to 1, indicating that no pieces have moved. If the loop is dealing with the second rank (if y equals 1), then a value of 1, indicating a white pawn, is stored in the current element of board. If the seventh rank is under consideration, a -1 for a black pawn is stored instead. Both loops then close.

The final function we'll be looking at this month is drawboard() (DRBOARD). The display it produces is fairly crude, but workable. Feel free to improve it if you're a bit of a whizz on the graphics programming front.

The board's square are represented, naturally enough, by black and white blocks, while the pieces, drawn in black ink, are displayed as initials and are drawn in inverse mode if they represent white and normal otherwise.

The procedure first prints the x axis at the top of the board, labelling it from "A" to "H". Notice that it prints two spaces in from the left margin before commencing the axis.

A loop now cycles through each of the ranks in turn, with its index y moving between the values 0 and 7. For each new y, a left-hand rank coordinate is printed. Notice that 1 is added to it, to ensure that a number between 1 and 8 is displayed. Computers like to index their arrays starting from zero, humans like to start counting from one. Before it is printed, a carriage return is first printed to ensure that we're beginning on a new line. No carriage return is printed afterwards, so that the following print statements' output will continue on the same line.

The x loop cycles through each of the columns in the row under question. The program first of all checks whether the square it's dealing with is empty, by seeing if the value in board[x][y] is 0. If it is, then it must print a blank square.

The colour of this blank square must depend on its x and y coordinates if we're to get that distinctive chequered pattern. We can achieve this by checking if both the x and y coordinates are even, or if they are both odd, which is what the next conditional does. (The % operator, or Mod function in AMOS, finds the remainder of a division – if something is even it leaves no remainder after a division by 2.) If they are, then we switch on reverse printing. This is accomplished by a straightforward command in AMOS, but in C it has to be done by printing an ANSI escape sequence that switches the Shell console into inverse printing mode (Esc 7m).

A space is then printed and, regardless of whether it was switched on, inverse printing mode is switched off.

If the square was not empty, then one of the initials must be printed instead. If the contents of board[x][y] are less than zero, then we're dealing with a black piece, which must be printed in non-reverse mode. An element of the initials array is printed, index by the negative of the contents of the board[x][y]. So, if it contained a -1, then a "p" would be printed, and so on.

If the board contains a positive value, then we must first set inverse mode before printing the relevant element of initials (this time index by board[x][y] without the need for negativising, since it contains a positive value). Once the initial has been printed, inverse mode is again turned off to prevent interfering with the next character printed. Notice how a carriage return is not printed after a square, so that the next printed one can follow directly on from it.

Finally, both loops are closed and the routine ends by printing a couple of blank lines beneath the board it has drawn.

Type in the program so far, but don't try to run it. It won't work because it relies on functions not yet written. If you can't wait till next month, why not try commenting out the parts of the program that reference unwritten segments and get it so that you can test that setupboard() and drawboard() work properly? See you then. AS

C LISTING

```
#include <stdio.h>

/* constants */

/* data types */
struct move {
    int x;
    int y;
    int dx;
    int dy;
    int distance;
    int score;
    int piece;
    };

/* global variables */

int board[8][8];
int notmoved[8][8];
char pieces[7][8]={"empty","pawn","rook",☛
"knight","bishop","queen","king"};
int values[7]={0,10,50,30,30,90,1000};
char initials[7]={'
','p','r','n','b','q','k'};

/* function prototypes */
void setupboard(void);
struct move findmove(int piece,int x,☛
int y,int rotation);
int makemove(struct move trymove);
void erasemove(struct move trymove,int ☛
taken);
int evaluate (int player);
struct move bestmove(int player,int level,☛
int maxply);
void drawboard();
void humanmove();
int xcoord(char c);
int ycoord(char c);

/* main program */

void main()
{
    struct move computermove;
    int ply;

    /* initialise board */
    setupboard();
    printf("Enter number of ply\n");
    scanf("%d",&ply);

    /* enter main loop */
    do {
   drawboard();
   computermove=bestmove(1,1,ply); /* make ☛
computers move */

   makemove(computermove);
   /* update notmoved array to reflect ☛
change */
   /* both square moved from and square ☛
moved to are modified */
   notmoved[computermove.x][computermove.y]=0;
   notmoved[computermove.x+computermove.dx* ☛
computermove.distance][computermove.☛
y+computermove.dy*computermove.distance]=0;
   drawboard();
   printf("\n\nMy move:\n %s
",pieces[computermove.piece]);
   printf("from
%c%c",65+computermove.x,49+computermove.y);☛
   printf(" to
%c%c\n\n",65+computermove.x+computermove. ☛
dx*computermove.distance,49+computermove.☛
y+computermove.dy*computermove.distance);

   humanmove();

    } while (1);
}

/* function definitions */

/* convert x coord to number */
int xcoord(char c)
{
    return c-65;
}

/* convert y coord to number */
int ycoord(char c)
{
    return c-49;

}

/* place pieces on board */
void setupboard(void)
{
    int x,y; /* loop variables */

    for (x=0;x<8;x++)
   for (y=0;y<8;y++) {
       board[x][y]=0;
       notmoved[x][y]=1; /* no pieces so ☛
far have moved */
       if (y==1)
     board[x][y]=1; /* white pawn */
       if (y==6)
     board[x][y]=-1; /* black pawn */
   }
    board[0][0]=2; /* white rook */
    board[7][0]=2;
    board[0][7]=-2; /* black rook */
    board[7][7]=-2;
    board[1][0]=3; /* white knight */
    board[6][0]=3;
    board[1][7]=-3;
    board[6][7]=-3;
    board[2][0]=4;
    board[5][0]=4;
    board[2][7]=-4;
    board[5][7]=-4;
    board[3][0]=5;
    board[4][0]=6;
    board[3][7]=-5;
    board[4][7]=-6;
}

void drawboard()
{
    int x,y;
    printf("\n\n  ABCDEFGH");
    for (y=0;y<8;y++) {
   printf("\n%2d",y+1);
   for (x=0;x<8;x++)
       if (board[x][y]==0) {
     if ((x%2==0 && y%2==0) || (x%2==1 && ☛
y%2==1))
         printf("%c7m",155); /* switch to ☛
reverse printing */
     printf(" %c0m",155); /* print a ☛
square and switch to normal printing */
       } else {
     if (board[x][y]<0)
         printf("%c",initials[-board[x][y]]);
     else

printf("%c7m%c%c0m",155,initials[board[x] ☛
[y]],155);
       }

    }

    printf("\n\n");
}
```

GETTING THE MAX

As promised last month, here's some more insight into how the computer chooses its move.

As we've already discussed, the algorithm consists of a move generation part, which effectively tries each legal move available, and an evaluation part that assigns a score to a move. The score is a simple assessment based only on consideration of materiel, so the intelligence in the computer's play comes from it being able to look ahead and see future consequences of its moves.

The big stumbling block here is in anticipating how the human player will react. The computer has a cast-iron algorithm – it can know exactly how it will play at any point in the game simply by altering the board array accordingly and calling bestmove() – but it doesn't know what the response will be.

The solution comes in the form of something called the 'mini-max' algorithm, which assumes that the player will respond with the best move available. And this best moved is decided by exactly the same routine, bestmove(), that decides which is the computer's best move. As a consequence, bestmove() must take a parameter that indicates on which side's behalf it is considering a move, and must be capable of playing for either side.

The goal of the routine then becomes, not simply to make the best move, but to make the move such that it produces the weakest response from the player, even though the player will be making the best move possible in the circumstances. It minimises the player's maximum (or best) move. The difference is subtle, but important.

So once bestmove() makes a move, it doesn't evaluate it, but instead recursively calls itself to see what the player's best response will be and get a score for that move. The higher this score, from the player's point of view, the lower the score, from the computer's, of the move that induced it. The computer then picks as the best from its moves the one with the highest score.

So far, all we've got is spiralling recursion, looking ahead as far as the end of the game. The concept of 'ply', or degree of look-ahead, puts a stop to the recursion. Look-ahead is measured in half-moves. A half-move is a move by either the computer or the player; a full-move a move by one and then a response by the other. The number of half-moves that the machine looks ahead is known as the number of ply. You need at least three ply to get anything like a sensible game.

Once bestmove() has been recursively called for as many times as there are ply, instead of calling itself again to evaluate a move it calls the evaluate() function that adds up the materiel value on the board to arrive at the move's score. This value is then passed back down the recursion as being the value of an opponent's move.

It all takes a bit of getting your head around, and will probably become clearer when we look at the code for it in a couple of months and go into it in more depth. In the meantime, it's something to ponder over.

AMOS LISTING

```
' first declare and initialise variables
Dim BOARD(8,8)
Dim NMOVED(8,8)
Dim PIECES$(7),WORTH(7),INITIALS$(7)
' read names of pieces into PIECES$ string ☛
array, values into WORTH array
' and initials into INITIALS array
For I=0 To 6
   Read PIECES$(I),WORTH(I),INITIALS$(I)
Next I
Data "empty",0,"
","pawn",10,"p","rook",50,"r"
Data
"knight",30,"n","bishop",30,"b","queen",90,☛
"q","king",1000,"k"

' CURRENTMOVE array represents the ☛
structure containing parameters of a legal ☛
move
' 0 = x pos, 1 = y pos, 2 = dx, 3 = dy, ☛
4 = distance, 5 = score, 6 = piece
Dim CURRENTMOVE(7)

' make BOARD,MOVE, NMOVED,PIECES,WORTH and ☛
INITIALS$ globally available to all
procedures
Global BOARD(),NMOVED(),PIECES$(),WORTH(),☛
INITIALS$()

' call procedure to initialise board, ☛
ready for play
SETUPBOARD
' set up screen colours and clear screen
Paper 2
Pen 0
Cls

' ask the player for the required number of
ply

Print "Enter number of ply"
Input PLY

' now to create main loop that is executed
until game ends
' (add finitum, at present...)

Repeat

   ' draw board then find computer's move
   DRBOARD
   BESTMOVE[1,1,PLY]
   '  modify the board array accordingly
   MAKEMOVE

   ' update move array to reflect change
   ' both square moved from and square ☛
moved to are modified
   NMOVED(CURRENTMOVE(0),CURRENTMOVE(1))=0
   NMOVED(CURRENTMOVE(0)+CURRENTMOVE(2)*☛
CURRENTMOVE(4),CURRENTMOVE(1)+CURRENTMOVE(3)
☛ *CURRENTMOVE(4))=0
   DRBOARD
   Print : Print
   Print "My move:"
   Print PIECES$(CURRENTMOVE(6));" from
",Chr$(CURRENTMOVE(0)+65);Chr$(CURRENTMOVE ☛
(1)+49);
   Print " to
",Chr$(CURRENTMOVE(0)+CURRENTMOVE(2)* ☛
CURRENTMOVE(4)+65);Chr$(CURRENTMOVE(1)+☛
CURRENTMOVE(3)*CURRENTMOVE(4)+49)

   ' now get player's move
   HUMANMOVE

Until 0

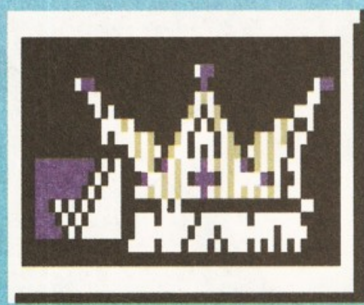
' define procedures

' convert an x coord, expressed as an ascii☛
letter, into a number between 0 and 7
Procedure XCOORD[C$]
   RESULT=Asc(Left$(C$,1))-65
End Proc[RESULT]

' convert a y coord, expressed as an ascii☛
number, into a number between 0 and 7
Procedure YCOORD[C$]
   RESULT=Asc(Left$(C$,1))-49
End Proc[RESULT]

' SETUPBOARD initialises board, ready for ☛
play
' starting positions
Procedure SETUPBOARD
   For X=0 To 7
      For Y=0 To 7
         ' step through each square in turn☛
' clear the square
         BOARD(X,Y)=0
         ' and mark it as not having moved,☛
regardless of whether there's a piece there
         NMOVED(X,Y)=1
         ' place a white pawn if in second ☛
rank
         If Y=1 Then BOARD(X,Y)=1
         ' and a black pawn if in second from
last rank
         If Y=6 Then BOARD(X,Y)=-1
      Next Y
   Next X
   ' white rooks
   BOARD(0,0)=2
   BOARD(7,0)=2
   ' black rooks
   BOARD(0,7)=-2
   BOARD(7,7)=-2
   ' white knights
   BOARD(1,0)=3
   BOARD(6,0)=3
   ' black knights
   BOARD(1,7)=-3
   BOARD(6,7)=-3
   BOARD(2,0)=4
   BOARD(5,0)=4
   BOARD(2,7)=-4
   BOARD(5,7)=-4
   BOARD(3,0)=5
   BOARD(4,0)=6
   BOARD(3,7)=-5
   BOARD(4,7)=-6
End Proc

' procedure to draw the board and pieces ☛
on it
Procedure DRBOARD
   Print : Print
   Print "  ABCDEFGH";
   For Y=0 To 7
      Print
      Print Y+1;
      For X=0 To 7
         If BOARD(X,Y)=0
            If(X mod 2=0 and Y mod 2=0) or ☛
(X mod 2=1 and Y mod 2=1)
               Inverse On
            End If
            Print " ";
            Inverse Off
         Else
            If BOARD(X,Y)<0
               Print INITIALS$(-BOARD(X,Y));
            Else
               Inverse On
               Print INITIALS$(BOARD(X,Y));
               Inverse Off
            End If
         End If
      Next X
   Next Y
   Print
   Print
End Proc
```



CANINE COMMS

– STILL THE DOGS DOO-DAHS

What with the constant media attention given to the Internet,you may be forgiven for thinking that Fidonet no longer exists.This month Davey Winder discovers that the Information Superhighway isn't a one way street, that the dog hasn't had its day, and that canine comms look as healthy as ever. Woof woof......

Many years ago, the Internet was limited to a few universities and military sites. If you, as a typical computer user, wanted to get on line, you logged onto a local BBs and read the messages carried on Fidonet.

FIDONET BASICS

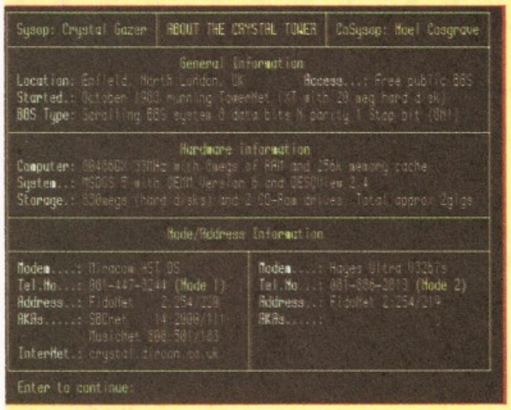
Fidonet sprang to life in 1984 when Tom Jennings, a USA Bulletin Board System Operator, wanted to try give users of his system the ability to send messages to users of a BBS that was operated by a friend of his. Tom sat down and wrote a program called Fido that would collect and archive all the messages waiting to be sent to this other BBS, then call the system late at night when it wasn't busy and deliver them.

Another Fido program running on the second BBS would then unarchive the messages and put them in the correct message areas. Although possibly something of a surprise to Tom, but certainly not surprising now if you look at it with the benefit of hindsight, the idea was received with more than just a little bit of enthusiasm. Within three months there were 50 other Bulletin Boards running Fido programs, and Fidonet was born. At the end of the first year the number of BBS's sending messages using the Fido network had grown to 150, and now just 10 years later the figure is in the region of 30,000.

Converting that figure of BBS's connected to Fidonet into the number of actual users is very much guesswork, as nobody really knows how many people are using these BBS's at anyone time. A viable estimate would be that each of the member BBS's has 100 members on average, so the total number of Fidonet users world-wide is something like 300,000. Of course, Wavey could be talking out of his teapot again and I'm sure that I'll be getting some colourful Email about my figures from Fido fanatics.



An image of, and indeed by, the creator of Fidonet Tom Jennings. This image was downloaded from the Electronic Frontier Foundation graphics archive at www.eff.org



The Crystal Tower information screen, which gives you all the info on what sort of hardware the Crystal Tower runs on.

INSIDE FIDONET

The Fidonet system offers its users many things, including private "Netmail", open discussion areas, file storage areas, and quite often on-line games and even links to the Internet itself.

Netmail is Email that can be sent to anyone who uses a Fidonet BBS, wherever in the world that BBS may be situated. You can't send Netmail outside of Fidonet, to an Internet address for example. Although I said that Netmail was private in the introduction to this section, that isn't strictly true as theSysOp of any BBS that the mail passes through could, in theory, read it. However, in practise this doesn't happen as a SysOp would soon find himself running a Bulletin Board with no Bulletins if this was discovered. The main disadvantage of Netmail is that it can be fairly slow, certainly in comparison with Internet email, which is due to the mechanics of Fidonet itself.

Fidonet is, as I've already mentioned, composed of 30,000 different Bulletin Board Systems, located all over the world. In order for these systems to be able to identify and talk to each other efficiently they need some method of addressing, Fidonet uses four dimensional addressing, and this achieved by a system of Zones, Regions, Nodes, and Points. A Zone relates to the biggest geographical amalgam in Fidonet, usually a continent. For example, Zone 1 is North America, Zone 2 is Europe, and Zone3 is Australia. A Region denotes the specific geographic location within each Zone, and a Node is the actual Bulletin Board System itself. Points are attached to each BBS, and can offer the user an address for his or her own computer that is based at the local Fidonet Node.

Messages are transferred between all these systems by each Node automatically calling its "Boss Node" at a set time each night when packets of messages are transferred and received. The messages then pass on to another "Boss" and so on until they have travelled along the backbone of the system and found the BBS they are destined for. Obviously, when systems are only connecting on a once a day basis, it can take a matter of days and sometimes weeks, for message to arrive at their destination and for you to receive a reply. This slowness is inherent in the system, but is offset considerably by the fact that Fidonet BBS's are, by far and large, free to use. Even those who do charge an annual subscription tend to have very low fees. In the case of Fidonet you generally get very much more than what you pay for!

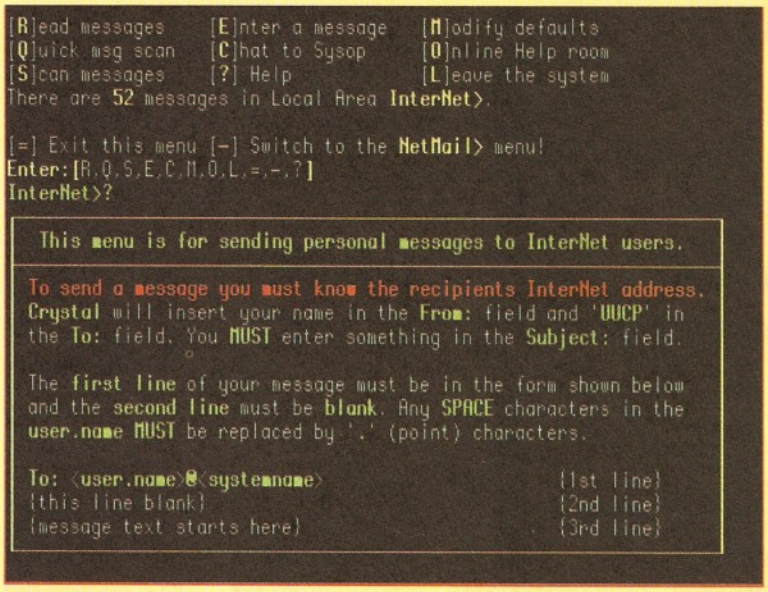
ECHO ECHO E ECHO (OK, THAT'S ENOUGH WAVEY)

Fidonet has open discussion areas that are similar in concept to the Newsgroups of Usenet, or conferences of Cix, CompuServe, and Delphi. If you are looking for the closest comparison with Internet resources then it would have to be the Mailing List. Known as Echoes, every Fidonet BBS carries them although the exact number carried is up to the SysOp and the demands of the BBS members. An Echo carries messages on a subject matter as defined by the Moderator of that Echo, and all messages contributed are sent essentially by email (called Echo Mail in this case).

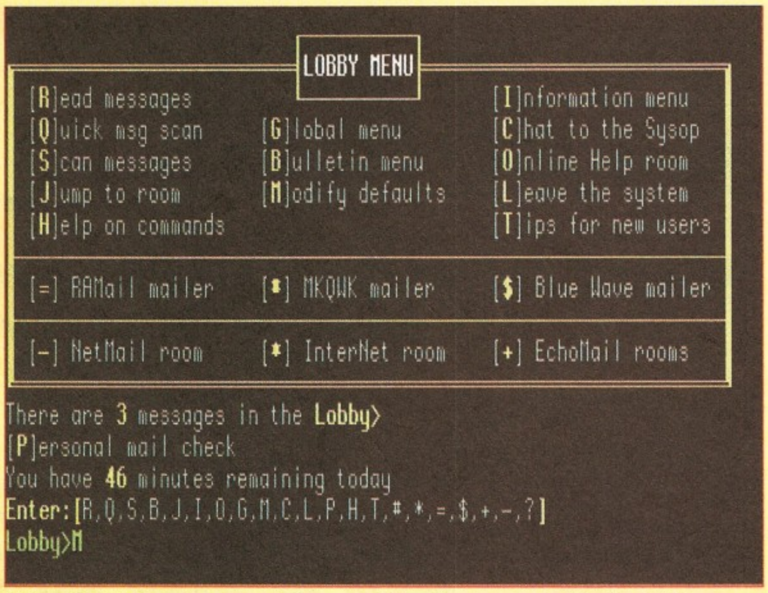
There are Echoes that cover every conceivable subject, some of which are really rather unusual or even totally teapot in certain cases. I was going to take a look at a network of Echoes that was being carried on Fidonet BBS's and covered Pagan religions and paranormal happenings, which went by the name of Incarnet. But due to unforeseen circumstances I can't do this,the BBS's that I use no longer carry Incarnet Echoes because, as I understand it, there were some hassles about who was in control and it just seemed to die. However, I have been taking a look at one of my favourite FIdonet BBS's and seeing what has been happening in the Echoes there, and I'll tell you all about that in just a moment.

FIDONET FILES FACTFILE

One of the great attractions to any Fidonet BBS is the sheer number of PD and Shareware files that they have available for you to download. Even if your local BBS doesn't have a particular file you want, the chances are that another on thenetwork will have. You can make a file request or "frequest"



The Internet Room, complete with on-line help forsending Internet Email"



FRom the Lobby you can go into any of the other rooms in The Crystal Tower.

as it is know, to get the file transferred to your local Node, many systems even have a system of "Magic Filenames" that allow you to find a file without knowing the exact file name. This is handy of you want a file but don't know what the latest version is, using frequest along with a magic filename you can automatically get the latest version without worry.

THE CRYSTAL TOWER

A really good example of the way Fidonet BBS's continue to travel in the fast lane of the Information Superhighway is The Crystal Tower. The SysOps are Noel Cosgrave and the mysteriously named Crystal Gazer, and a very good job they do as well. Established in 1983, yes 1983, The Crystal Tower has come a long way since its humble origins and now offers approximately 2 Gigabytes of on-line storage, two high speed access numbers, an Internet mail gateway, and a very lively range of Echoes. The BBS runs using Remote Access software, and this serves it very well, with a structure based around the concept of rooms. There are rooms that cover many different topics, and in each room you can find Echoes and files. Whilst not being negative about the influence and strength of Fidonet as a network, the Crystal Tower recognises that a connectivity to the Internet isimportant in the 1990's and so offers its members an Internet Room. One of the things that you can do from here is send Email to any Internet address, on-line help is on hand in case you need it, and it makes the whole process nice and simple. I'm glad that more Fidonet BBS's are seeing the positive benefits to its members of this increasing of communications flexibility.

Crystal Tower takes pride in being an easily accessible syste, and this is no more true than in its use of easy menus to get around. A few of the big commercial on-line systems could learn a thing or two about user friendliness from these people, I can assure you!

Registration is very straightforward, no personal questions are asked and the system is totally free to individual users. On connection to the system you will find yourself at the"Lobby" menu, from where you can explore the Tower at your leisure. Actually not quite at your leisure as there is a time limit on your daily calls, the exact amount of time depends on what user status you are granted. For example, someone with User Status of 10 (a new user) gets 30 minutes a day whilst a User Status of 20 (a regular user of the system) gives you 45 minutes a day to look around. Personally I find this quite acceptable as the Crystal Tower is a busy, well supported, Bulletin Board and it is only fair that all its users should get a chance to use it.

I mentioned earlier on in these pages that there was a lot of interesting discussion going on at The Crystal Tower, and I wasn't telling fibs. With almost 200 Echoes available, including such networks as MusicNet and ParaNet, you can be assured of finding something somewhere that will tickle your fancy. I took a quick look around the ParaNet areas, which are related to subject matter of a paranormal nature, and found interesting if oddball conversations on the following topics:

Abduction by Aliens in New Zealand
Black holes
Ex-Presiden Nixon and dead aliens in Florida
Statues on Mars

And there were plenty more, believe me. But it's not all "Aliens Ate My Hamster" stuff, there are lots more useful groups available, such as Comms, Law_Room, CommUnity, Online_Help,Disabled, Amiga, Amiga_Tech, and nearly 200 more.

THE CRYSTAL CONCLUSION

Crystal Tower isn't an Amiga run BBS, it doesn't cater for Amiga users any more than it caters for Macintosh or PC users, it is for everyone and as such you can get a much wider cross-section of debate about all matters. If you want to take a look at a Fidonet BBS then you certainly won't regret getting connected to the Crystal Tower, you have Waveys Word on that. To try it out for yourself you should call 081 447 8244 (HST DS number) or 081886 2813 (V32bis number). Set your comms software to the customary 8,N,1 and you should have no problems. AS

JARGON BUSTING

Cix The Compulink Information eXchange, on of the largestcommercial conferencing systems in Europe

CompuServe An enmormous commercial On-Line Service, with morethan 2 Million members world-wide

Delphi One of the American "big five" On-Line Services, now operating a UK service as well

Information Superhighway A term used to describe the future ofinformation tecnology, which covers the Internet, Video On Demand, Home Shopping, On-Line Services and much more

The Internet A global network of computer networks, withsomething like 30 Million users world-wide

Mailing List A method of distributing discussion groups bymeans of Internet Email

MusicNet A collection of music related Echoes

ParaNet A collection of paranormal related Echoes

SysOp The SYStem OPerator of a Bulletin Board

Usenet An Internet distributed collection of around 7000discussion groups

CONTACT POINT

If you want to talk to Wavey Davey, maybe you have something to say about the Comms Column, maybe there is something you thinkshould be covered, or you may even have some news for us, then you can send Email to the following addresses:

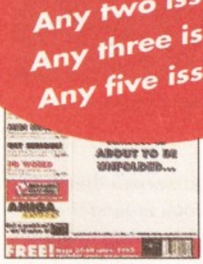
amshop@wavey.demon.co.uk
dwindera@cix.compulink.co.uk
waveydavey@delphi.com

Wavey Davey cannot guarantee that he will reply to your message, he's a pretty busy guy these days, but he will read everythingthat he receives.

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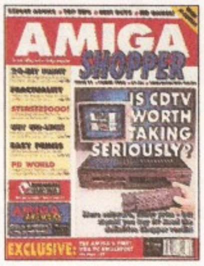


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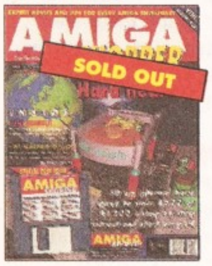
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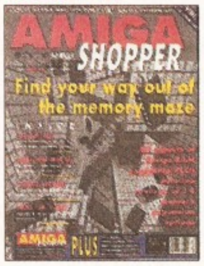
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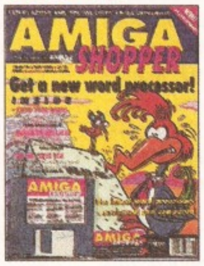
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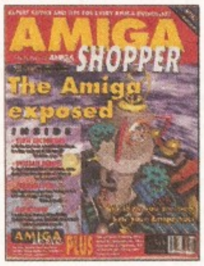
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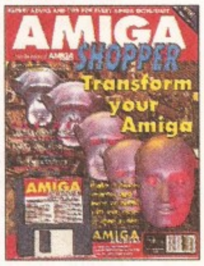
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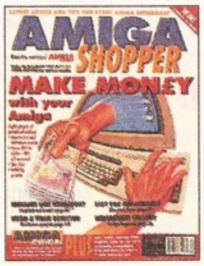
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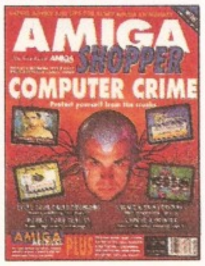
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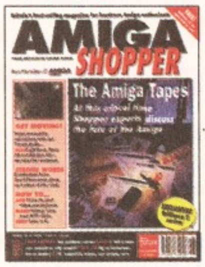
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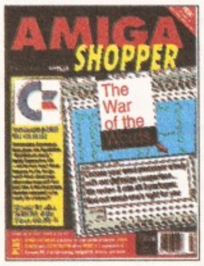
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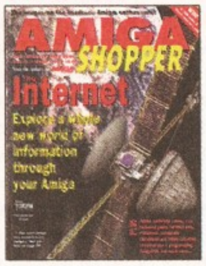
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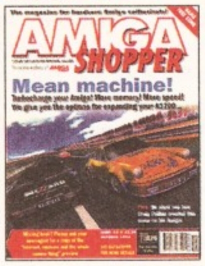
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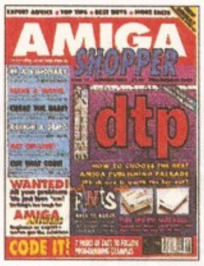
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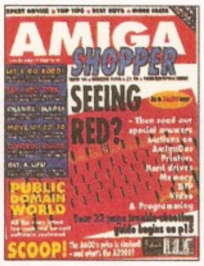
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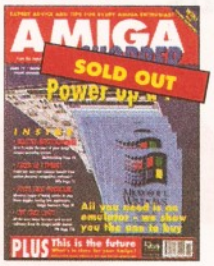
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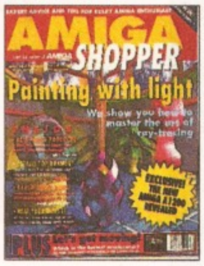
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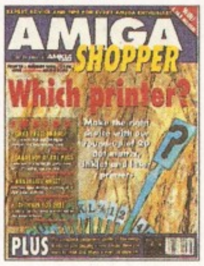
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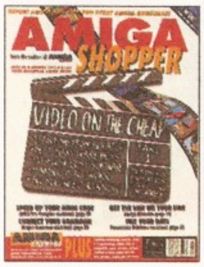
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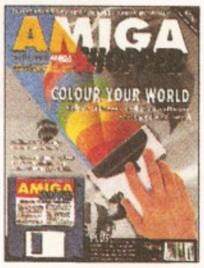
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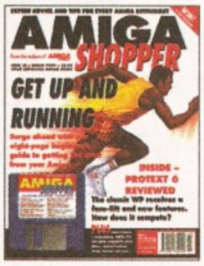
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ISSUE 34



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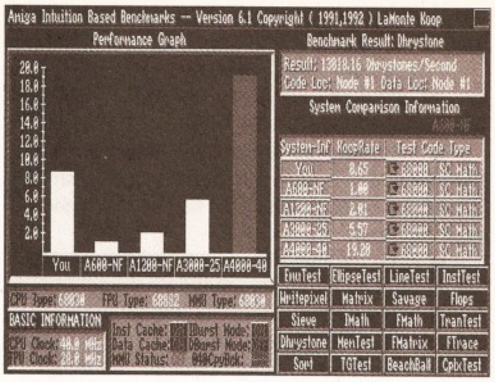


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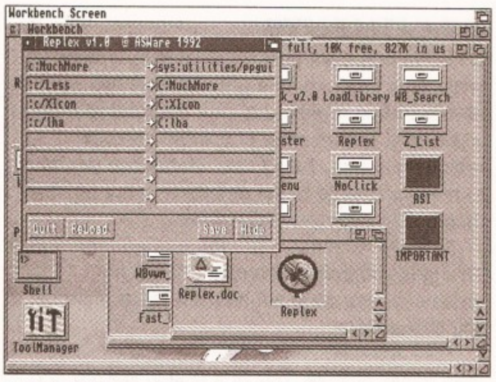
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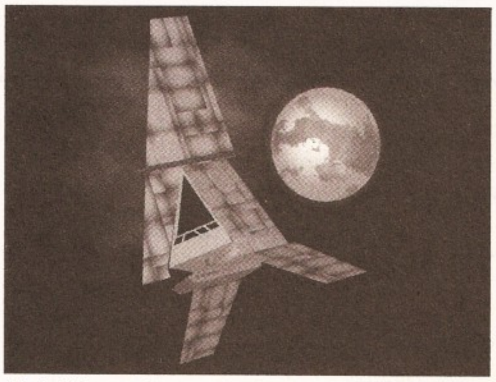
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C PROGRAMMING

New concepts all round this month, as Toby Simpson shows you how to write a useful file finding utility for Workbench 2 or above.

Something fun this month – we are actually going to write a genuinely useful utility. How many times have you wanted to find a particular file only to spend ages with the Workbench or shell attempting to locate it?

Users with hard disks are likely to be especially sympathetic to this one. This is because if you have lots of partitions and directories it is often quite tough to remember where you put something after a few months. A utility which searches an entire partition and tells you where particular files are is particularly handy in situations such this.

So, this month, you are going to write a small utility which will do just this. You will be able to specify the directory to search and the search pattern before the program finds any matches.

The more awake among you are already saying: "Ah, but AmigaDOS already comes with such a utility in the C drawer, SEARCH". Indeed it does, and it does the job, but next month you are going to make yours unique. You will add a full graphical user interface (GUI) to it, complete with buttons and menus to make it user-friendly, and then add ARexx control to it.

The goal of this is two-fold:

- it gives you a chance to work on new concepts which you haven't uses before and,
- you can show a useful application building up, and discuss how you can design it in the first place so that further expansion is more straightforward.

SPECIFICATION

The first part of any project design is a specification. This is where you decide what the program is to do.

Let's go over your specification:

- It must be written in C and be compatible with both SAS C and DICE.
- The program will initially be run from the CLI. It will take two parameters: a search path and the search pattern. Wildcards must be valid for the search pattern.
- The program will use recursion to search sub-directories within directories.
- The program should be written with a future GUI and ARexx support in mind.

This immediately brings up three new things: arguments to CLI programs, wildcards and recursion.

ARGUMENTS

C makes argument passing to programs easy. When your program runs you can have two pieces of information available to you: the total amount of arguments and an array of pointers to each argument in turn. To get this information you have to make a change to the definition of the function main(). Normally you might write:

```
void main(void)
```

This tells you that your program takes no arguments and does not return a value. However, if you change it to:

```
void main(int argc, char *argv[])
```

then things change. This is a built-in feature of C.

The integer variable argc tells us how many arguments are present while argv is an array of pointers to each argument in turn. Because the first argument (argv[0]) points to the name by which

THE FULL LISTING FOR OUR FINDER UTILITY

```
    /***************************
**
**   $Id:   finder.c
**
**   File Finder Utility with wildcards for the Amiga Shopper C
programming
**   course. Demonstrates recursive programming techniques and argument
**   passing.
**
**   By Toby Simpson
**
**   To compile under dice:
**          dcc finder.c -o finder
**   The resultant executable will be called "finder" To compile under
**   SAS C, copy the "starter_project" drawer to where you want, and
**   type the listing as "finder.c". Double click on "Build" to make
**   the executable.
**
**   Tested under DICE (Complete Amiga C version) and SAS C 6.51
**
**   NOTE FOR DICE USERS:
**   Earlier DICE releases (And some freeware versions) do not support
**   the __aligned keyword. The version with "Complete Amiga C" does.
*/
    #define          FINDER_VERSION          "Finder 1.00 (28.08.94)"
    #include
<stdio.h>
#include
<stdlib.h>
#include
<string.h>
    #include
<dos/dos.h>
#include
<exec/exec.h>
#include
<clib/dos_protos.h>
#include
<clib/exec_protos.h>
    /*
**   Function prototypes:
*/
BOOL SearchDir(char *directory, char *pattern);
BOOL NotifyFind(char *file);
    /*
**   Global variables:
*/
long files_matched     = 0;                                      /*
Total files found */
char *VERSION                       = "\0$VER:"FINDER_VERSION;
    /***************************
**
**   void   main(void)
**
**   Main program entry function.
*/
    void   main(int argc, char *argv[])
{
    char   search_dir[64];
    char   search_string[64];
    char   search_pattern[128];

    /*
    **     Title us and parse arguments:
    */
    printf("%s\n", FINDER_VERSION);
           if (argc != 3)
           {
           printf( "Argument count incorrect:\n"
                                              "Usage: FINDER path☛
matchpattern\n");
           return;
           }
           strcpy(search_dir, *++argv);
    strcpy(search_string, *++argv);
           printf("Scanning '%s' with a match string of '%s'\n",
           search_dir, search_string);
           /*
    **     Pre-Parse the AmigaDOS search pattern:
    */
    ParsePatternNoCase(search_string, search_pattern, 127);
           /*
    **     Start the search:
    */
    if (!(SearchDir(search_dir, search_pattern)))
           printf("An error has occoured.\n");
           /*
    **     End program stats:
    */
    printf( "Operation complete, %ld matches found.\n", ☛
```

the program was invoked argc is always at least one. For example, if your file find utility was called 'finder', and you typed this from the shell:

```
finder
```

argc would be one and argv[0] would point to the string 'finder'. If you had typed:

```
finder hello world
```

argc would be three and argv[0] would point to 'finder', argv[1] to 'hello' and argv[2] to 'world'. If you are not sure about this try typing in this little test program:

```
#include <stdio.h>
void main(int argc, char *argv[])
{
intloop;
   for (loop = 0; loop < argc; loop++)
   {
   printf("Argument %ld is '%s'\n", loop,
argv[loop]);
   }
   return;
}
```

It is quite simple and it shows you a list of arguments which were supplied to the program. If you compiled it as 'argtest' and ran it with the following command line:

```
argtest 1 2 3
```

the results on the shell window would be:

```
11.System3.1:> argtest 1 2 3
```

Argument 0 is 'argtest'
Argument one is '1'
Argument two is '2'
Argument three is '3'

If you want to supply arguments with spaces in them and have them treated as one single argument you can enclose them within inverted commas. Try the following example:

```
argtest '1 2 3' 'argument 2 really'
```

The results would be:
Argument 0 is 'argtest'
Argument 1 is '1 2 3'
Argument 2 is 'argument 2 really'

This is quite an easy way of dealing with program arguments and, as you can see, it is really quite straightforward. You use this argument feature in your finder program to get your two arguments and to check that the argument count is correct. Listing one contains the full listing for the finder; you will see at the beginning of the main() function how to process them.

PATTERN MATCHING

Valid Patterns for AmigaDOS ParsePattern(). For more information consult the AutoDoc file on dos.library, or the AmigaDOS Rom Kernal Reference manual.

?	Matches a single character.
#	Matches the following expression 0 or more times.
(ab|cd)	Matches any one of the items separated by '|'.
~	Negates the following expression. It matches all strings that do not match the expression (ie, ~(foo) matches all strings that are not exactly "foo").
[abc]	Character class: matches any of the characters in the class.
[~bc]	Character class: matches any of the characters not in the class.
a-z	Character range (only within character classes).
%	Matches 0 characters always (useful in "(foo|bar|%)").
*	Synonym for "#?", not available by default in 2.0. Available as an option that can be turned on.
	'Expression' in the above table means either a single character (ex: "#?"), or an alternation (ex: "#(ab|cd|ef)"), or a character class (ex: "#[a-zA-Z]").

RECURSION

Because of the nature in which C functions work, defining all variables locally on the stack, they can be used recursively. This means that a function can call itself. Each time the function calls itself a new set of variablesis created on the stack for that particular instance.

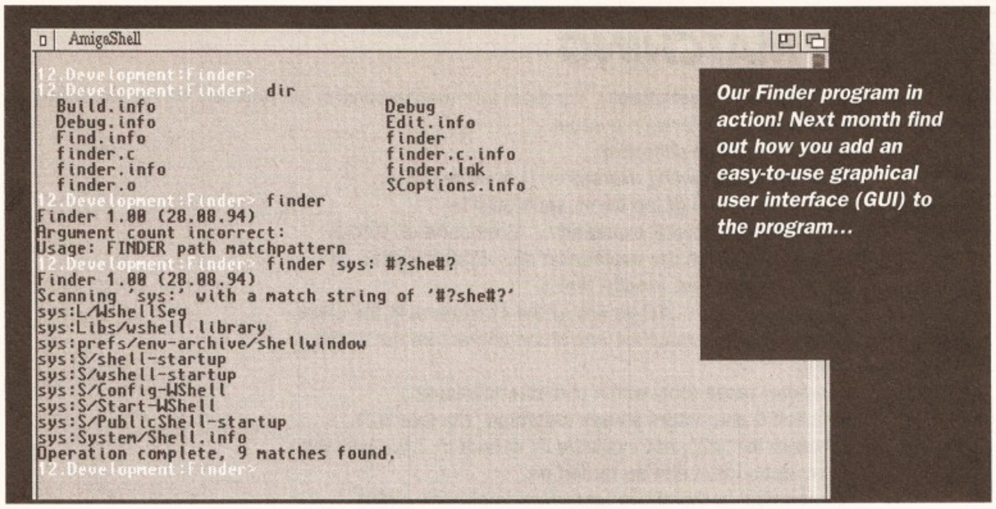
This does sound like a nightmare waiting to go horribly wrong but, in fact, it's surprisingly easy to grasp. The only real pitfall is stack usage: if a

```
files_matched);
        return;
}
   /**************************
**
**   BOOL   SearchDir(char *directory, char *pattern)
**
**   Search the named directory. All variables are local, this function
**   is recursive. Returns TRUE if the operation was OK, or FALSE for☛
and error.
*/
   BOOL   SearchDir(char *directory, char *pattern)
{
#ifdef _DCC
   __aligned struct  FileInfoBlock                  fib;
#else
   struct FileInfoBlock          __aligned  fib;
#endif
        BPTR                  lk                = NULL;
   char            full_path[255];
        /*
   **     Attempt to get a lock and the initial FIB:
   */
   if (!(lk = Lock(directory, ACCESS_READ))) return FALSE;
   if (!(Examine(lk, &fib)))
                   return FALSE;
        /*
   **   Scan directory:
   */
   while (ExNext(lk, &fib))
        {
        /*
        **            Deal with CTRL-C:
        */
  if (SetSignal(0L, SIGBREAKF_CTRL_C) & SIGBREAKF_CTRL_C)
  {
  printf("*** Program Aborted\n");
                 UnLock(lk);
  return FALSE;
  }

        /*
        **            Build full path spec:
        */
        strcpy(full_path, directory);
        AddPart(full_path, fib.fib_FileName, 255);

        /*
                                       **         ID File entry type:
                                       */
                                       if (fib.fib_DirEntryType > 0)
                                            {
                                            /*
                                            **            Got a directory, recursively scan it:
                                            */
                                            if (!(SearchDir(full_path, pattern)))
                                                 {
                                                 UnLock(lk);
                                                 return FALSE;
                                                 }
                                            }
                                       else
                                            {
                                            /*
                                            **            Got a file, try a match check:
                                            */
                                            if (MatchPatternNoCase(pattern, ☛
                            fib.fib_FileName))
                                                 NotifyFind(full_path);
                                            }
                                       }
                                       UnLock(lk);
                                       return TRUE;
                            }
                               /**************************
                            **
                            **   BOOL   NotifyFind(char *file)
                            **
                            **   Notify that a file was found. The file which matched is passed in
                            **   and this is then shown on the screen in what every way the program
                            **   decides. Returns FALSE for an error. (This months version always
                            **   returns TRUE however)
                            */
                               BOOL   NotifyFind(char *file)
                            {
                               /*
                               **     Count matches:
                               */
                               files_matched++;

                               /*
                               **     Show on screen:
                               */
                               printf("%s\n", file);
                                    return TRUE;
                            }
```



Our Finder program in action! Next month find out how you add an easy-to-use graphical user interface (GUI) to the program...

function calls itself which then calls itself, and so on. Then, for each time you go further in, a new chunk of memory vanishes from the stack. The default stack on an Amiga shell of 4000 bytes is sufficient for your finder utility to deal with up to 15 levels of recursion, which in this case is nested directories. This is not normally going to be a problem. However, if you were worried you could either increase the size of the stack or put some stack checking code within the program to detect when things were going to go wrong.

There is no checking code in our program this month because 15 levels of recursion is enough and because each compiler implements this sort of thing differently. Consult your compiler's documentation to add this checking code yourself.

Recursion makes your program very simple indeed. In fact, the listing is fewer than 200 lines long including comments! The core of the finder utility is a function called SearchDir(). This takes two parameters: the directory to search and the match pattern. SearchDir() then uses AmigaDOS functions to check every entry within that directory.

COMPULSIVE CHECKER?

Every file found is then checked with the match pattern and if it does match the NotifyFind() function is called, which shows the directory in which the match was found on the screen. If, however, instead of a file another directory is found then SearchDir() calls itself with the new directory. This is recursion.

The second SearchDir() then searches this new sub-directory and if it finds more directories it calls itself again and so on. This way, every file, in every sub-directory is checked. It's quite a good solution to the problem and it is also particularly handy for a lot of sorting and arithmetic operations.

Be wary of recursive functions accessing global variables. Everything SearchDir() requires to operate comes from locally declared variables, on the stack. If, you made the variable 'BPTR lk = NULL' a GLOBAL variable, for example, and declared it outside the function then this program would fail. This is because a second recursion of the function would corrupt a variable required by the first. When it returned the first would then have invalid data to work on. In this case the AmigaDOS lock, which would most likely cause a guru, so be warned. Recursion is a joy until this happens.

PATTERN MATCHING

I've pulled a bit of a fast one on Kickstart 1.3 users this month...

The pattern matching code in 'Finder' uses the AmigaDOS functions ParsePattern and MatchPattern to check if a file matches the supplied search pattern. The advantage of this, is that complex patterns can be specified. For example, it is possible to specify a search pattern that says 'Find every file with "ies" in it, but not if it begins with "t"'. And it is all done for you, and done automatically, at that.

The catch is that ParsePattern() and MatchPattern() are Kickstart 2 features. Users of 1.3 need to adapt the program to work without these functions, which is not too hard, but it is difficult to match the power of the AmigaDOS 2 features and the program grows somewhat in size.

SO HOW DOES IT WORK?

Well, it works in two stages. Firstly, AmigaDOS requires that the search pattern is parsed into a special format which it can understand. You do this using the ParsePattern() function.

In the Finder program you use an alternative

> **"I've pulled a bit of a fast one on Kickstart 1.3 users this month"**

version: ParsePatternNoCase() which is not case sensitive. ParsePattern takes ordinary AmigaDOS pattern, such as '#?.info' and tokenises it into an internal format. The MatchPattern() function uses this tokenised version to check if a match happened. You use MatchPatternNoCase() as you don't need to be case sensitive.

Here's MatchPattern() used within the program:

```
/*
** Got a file, try a match check:
*/
if (MatchPatternNoCase(pattern,
fib.fib_FileName))
NotifyFind(full_path);
```

That was easy wasn't it? Its a boolean function and it returns TRUE for a match or FALSE for a failure. Incidently, you may be interested to know that the MatchPattern function is highly recursive itself. The autodoc for it warns that you need at least 1500 bytes of stack!

DOS.LIBRARY FUNCTIONS

The Finder listing uses three dos.library functions which you may not have used before. In conjunction with each other they allow you to walk through the contents of a directory, checking each entry in turn to see if it is a file or a directory. The function which does the walking is called 'ExNext()'. Before ExNext() can be used, however, you need to use Examine() to get hold of a special structure called the FileInfoBlock for the directory you wish to search. Examine() requires you to have an AmigaDOS lock on the directory, which is what you use the Lock() function for. Remember to UnLock() any Locks you create: this is a common cause of difficulties in programs of this nature.

There is one very important thing to note about Examine() and ExNext(): the FileInfoBlock *must* be aligned to a four byte boundary. Unfortunately, and typically, both SAS C and DICE do this in different ways, so you must use compiler pre-processor statements to ensure that the compiler sees the correct version:

```
   #ifdef _DCC
   __aligned struct  FileInfoBlock      fib;☛
#else
   struct   FileInfoBlock  __aligned    fib;☛
#endif
```

If you are using DICE a special symbol called _DCC is defined by the compiler. You can detect this and ensure that the appropriate line is seen. If you are using a compiler other than SAS or DICE, then you need to check your compiler documentation to see how to specify this.

IS THE SEARCH OVER?

The other thing of interest is the way in which you detect if the user has aborted the search. You can do this using CTRL-C. On a large partition, this program may take some time and there needs to be a way of aborting it. In the GUI-based version, you have an ABORT button but in this case the user holds down Control and taps C to abort the search.

How is this done?

Well, for each and every task running on your Amiga, a special long word of information is held. These are called the signals. Several are available for your own special use (you have used signals before when dealing with window messages), but some are pre-defined by the system. You are interested in SIGBREAKF_CTRL_C, which becomes set if the running process has received a CTRL-C in its input stream.

You can detect this with the SetSignal() function from exec.library:

```
   /*
   ** Deal with CTRL-C:
   */
   if (SetSignal(0L, SIGBREAKF_CTRL_C) &☛
SIGBREAKF_CTRL_C)
         {
         printf("*** Program Aborted\n");
      UnLock(lk);
         return FALSE;
         }
```

Note that you remember to UnLock your Lock!

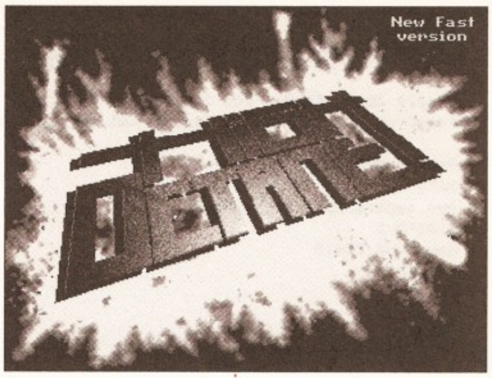
EXPANSION PROSPECTS

I have introduced several new concepts this month, which you are going to build on over the next two months. Eventually you will have a full GUI-based Finder utility which supports ARexx. The latter feature will allow you to write small ARexx scripts which will search multiple volumes, very handy for those of you with lots of hard drive partitions.

I have made it easy to expand by keeping things as simple and modular as possible. Note that there is a NotifyFind() function and, although this may be pretty pointless in this CLI- based version, when you add a GUI, this function will be responsible for updating the list on screen of all matches found.

So, heat up the compiler and I'll see you here next month! AS

AMOS Action



'High Octane' – not what you'd call a gas, exactly, but a game of a level of quality that other AMOS games programmers should aspire to

Create 3D illusions – Simon Green invites you into the seemingly absurd world of SIRDS.

I'm sure most of you have seen the sorts of pictures displayed overleaf. The technical term for them is 'single image random dot stereograms' (SIRDS), or just auto stereograms. If you look at them normally they just look a mess but when you view them in a special way SIRDS produce a startling illusion of depth.

They seem to have become a craze over the last year or so and the shops seem to be full of posters, postcards and even videos of these strange images. Someone, somewhere is making a lot of money out of SIRDS, now with the help of your Amiga and AMOS, you too can join in the fun.

SEEING IS BELIEVING

For those of you who have never come across auto stereograms before, your first problem is teaching yourself to 'see' them. Viewing SIRDS takes a little practice but is usually worth the effort. It can seem like some kind of conspiracy when you can't see them and everyone else can but, believe me, the effect is real. I was quite sceptical before I saw one for the first time...

It helps to understand what your eyes are doing when you look at an auto stereogram. Normally when you look at a distant object your eyes do two things:

- they rotate inwards towards each other so that each is pointing directly at the object in question – convergence;
- they focus at the object – accommodation.

The key to viewing SIRDS is to converge your eyes at a distance 'behind' the page (or screen), on which it is printed, that is equal to the distance of your eyes from the page, while still focusing on the dots on the page itself.

Obviously, in normal circumstances, this isn't the sort of thing your eyes do very often and so it does take a little practice.



This month's listing takes a picture and produces a seemingly random arrangement of dots.(see page 73)

The diagram on page 73 illustrates the viewing process. I think the easiest way to view SIRDS is to arrange for you to see your own reflection on the image and then stare at it.

This is easiest if the image is on your monitor, since you should be able to see your reflection in the screen. If, however, the images are on paper, (such as the ones on page 73) you can get the same effect by sticking the page on to the outside of a piece of glass (such as a window) and then arranging the lighting so that you can see your reflection.

Make sure that the picture is horizontal and look at it straight on from a distance of a metre or so. The further away you are from the picture, the greater the depth effect becomes. Stare at your reflection through the image, and let your eyes unfocus. Let your gaze wander over the whole image. After a few minutes the image should pop into view. If it doesn't appear immediately, persevere. Like I say, it can take some practice.

Don't be satisfied with some sort of vague impression of depth – you will be in no doubt when you do finally see the effect. On the other hand,

GET THE NEW 'ZINE ON THE AMOS SCENE, PLAY THE LATEST GAMES

You can imagine my surprise and excitement this month when what should drop on my metaphorical desk but a brand-new AMOS disk magazine called 'AMOSZINE'.

It offers an entertaining mix of AMOS news, reviews, competitions and tutorials. There is plenty of text to read (see page 72) and some interesting source code too – even I learned something from it!

The creators of the magazine promise that each issue will feature the source code to a 'well-known' AMOS game – a nice idea since there is no better way to learn than by studying other people's work.

The authors have obviously been influenced by the style and content of the more well-known Amiga disk magazines such as Grapevine and RAW and this is no bad thing.

The magazine software is, of course, written in AMOS and the interface is very attractive and easy to use. Overall, I was impressed with the amount of work that had obviously gone into making 'AMOSZINE'. Most importantly, it seems to be supported by a lot of talented and enthusiastic AMOS programmers.

If you're interested in checking it out for yourself, send a cheque for £2.25, payable to 'S.Bye', to Steve Bye, 31 Wellington Road, Exeter, Devon EX2-9DU. And, if you have an AMOS magazine you want plugged, why not send me a copy?

Games are an area of the Amiga that Amiga Shopper traditionally shys away from, but let's face it, AMOS was originally designed to be a games creation language, and it would be silly to ignore this aspect of the scene. One of the most impressive AMOS games I have seen recently is 'High Octane'. It is best described as a two-player overhead-view driving game with guns and looks and plays like a cross between Psygnosis' 'Nitro' and the old Spectrum game 'Battle Cars'. The graphics, sound and overall presentation are professional and it's playable. From a more technical viewpoint, it's the first AMOS game I have seen that does a decent eight-way tile scroll. It also makes good use of the Turbo extension for extra speed.

The game was coded by Paul Overy while graphics and animation are by Paul Cottage. Nice one, boys! If you send a blank disk and an SAE you get the source code to the game and a map editor program – for free.

I can also recommend 'Scorched Tanks', 'Xap' and the commercial game 'Jetstrike' as enjoyable AMOS-created entertainment. So, why not ask your local public domain merchant for some copies and see what other people are doing with AMOS?

And finally some late breaking news about the Turbo extension... For those you who missed my brief review in the August issue, Turbo is an add-on for AMOS. It's purpose in life is to speed up your programs beyond recognition, particularly graphics functions.

Although originally in the public domain, it has now gone commercial. The latest version, Turbo Plus v2.0, includes a lot of interesting stuff and I hope to do a full review soon. The author also promises exciting features for the next version including: 3D vector graphics, 3D starfields, tile-based 'copper wrap' eight-way scrolling that takes virtually no processor time, three times faster sprites, three times faster screen commands and generally more speed all round.

I can't wait. Of course, all this is just vapourware at the moment, but if you would like more hype, you can E-mail the distributor, Ryan Scott at 'rscott@gate.net'.

The listing: a random dot stereogram generator

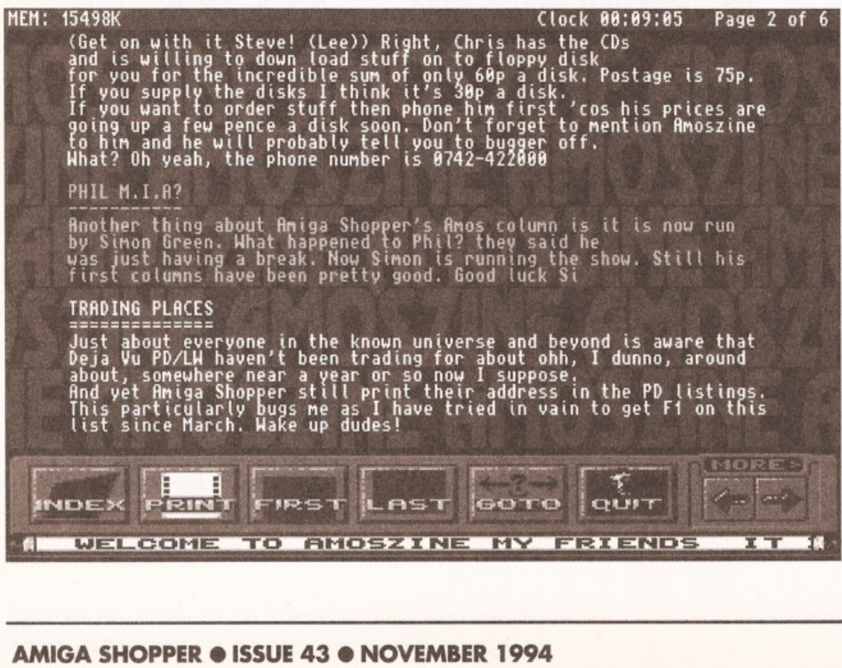
```
' Single Image Random Dot Stereogram Generator
' based on the Thimbleby, Inglis and Witten algorithm
'
' dots per inch
DPI=70
' eye separation (2.5 inches)
E#=DPI*2.5
' depth of field
M#=1.0/3.0
'
' image size
WIDTH=640 : XMAX=WIDTH-1
HEIGHT=256 : YMAX=HEIGHT-1
'
' use test pattern?
TEST=True
' do hidden surface removal?
HIDDEN=False
'
' stereo separation function
Def Fn SEPARATION(Z#)=((1-M#*Z#)*E#/(2-M#*Z#))
'
' depth functions
If TEST
   Degree
   Def Fn DEPTH(X,Y)=0.5+(Sin(X*720.0/XMAX)*Sin(Y*720.0/YMAX))*0.5
Else
   F$=Fsel$("","depthmap.iff","Select a picture")
   Load Iff F$,0
   SC#=Screen Colour-1
   Def Fn DEPTH(X,Y)=Point(X,Y)/SC#
End If
'
Screen Open 1,WIDTH,HEIGHT,8,Hires
Curs Off : Flash Off : Cls 0
For N=0 To 7 : Colour N,$222*N : Next
'
Dim PIX(XMAX),SAME(XMAX)
'
For Y=0 To YMAX
   '
   For X=0 To XMAX
      SAME(X)=X
   Next
   '
   Screen 0
   For X=0 To XMAX
      Z#= Fn DEPTH(X,Y)
      S#= Fn SEPARATION(Z#)
      LEFT=X-(S#/2)
      RIGHT=LEFT+S#
      '
      If LEFT>=0 and RIGHT<=XMAX
         VISIBLE=True
         If HIDDEN
            ' hidden surface removal
            T=1
            Repeat
               ZT#=Z#+2*(2-MU#*Z#)*T/(MU#*E#)
               VISIBLE= Fn DEPTH(X-T,Y)<ZT# and Fn DEPTH(X+T,Y)<ZT#
               Inc T
            Until(VISIBLE=False or ZT#>=1)
         End If
         '
         If VISIBLE
            L=SAME(LEFT)
            While L<>LEFT and L<>RIGHT
               If L<RIGHT
                  LEFT=L
                  L=SAME(LEFT)
               Else
                  SAME(LEFT)=RIGHT
                  LEFT=RIGHT
                  L=SAME(LEFT)
                  RIGHT=L
               End If
            Wend
            SAME(LEFT)=RIGHT
         End If
      End If
   Next
   '
   ' now draw the pixels on this line
   Screen 1
   For X=XMAX To 0 Step -1
      If SAME(X)=X
         ' free choice, choose colour randomly
         PIX(X)=Rnd(Screen Colour)
      Else
         ' constrained choice, obey constraint
         PIX(X)=PIX(SAME(X))
      End If
      Plot X,Y,PIX(X)
   Next
Next
End
```

don't expect some sort of amazing, full-colour 3D image to jump out of the page at you. The image you see has the same dotted colour and texture as when you look at the page normally, but in SIRDS parts appear to be at different depths.

GET THE RIGHT FOCUS

It doesn't really help to know what you're looking for, it's just a question of getting your eyes converged and focused at the right points. When this happens the image snaps into view. However, if you are really desperate, you can always try photo-copying the picture on to a transparency – the sort used on overhead projectors. Draw a cross on a blank sheet of paper and hold the transparency halfway between your eyes and the paper. Now stare through the transparency at the cross on the blank sheet and follow the instructions on the previous page. Trying it out in bright light and taking off your spectacles, if you wear them, can sometimes, although not always, help .

Finally, if after trying all these tricks you still can't see the effect, don't panic. A small percentage of the population can't see them. So if find you are one such don't kill yourself over it.



Name dropping in AMOSZINE – an impressive new AMOS disk magazine offering a mix of news, reviews, tutorials, and competitions. No prizes for guessing the software it is written in, though. So no answers on a postcard or anything else, thank you.

HOW DO SIRDS WORK?

The theory is quite complicated, but I'll try to provide a brief overview...

The human brain has lots of methods for working out how far away things are. Perspective, size, shading and texture all give clues as to the depth of objects. But the most powerful depth cue, at least for objects that are relatively nearby, comes from 'stereopsis'. Just as with most other sighted beings the human has two eyes each of which receives a slightly different view of the world. The brain fuses the image from each eye to create a single mental picture that includes depth. This process is known as stereopsis.

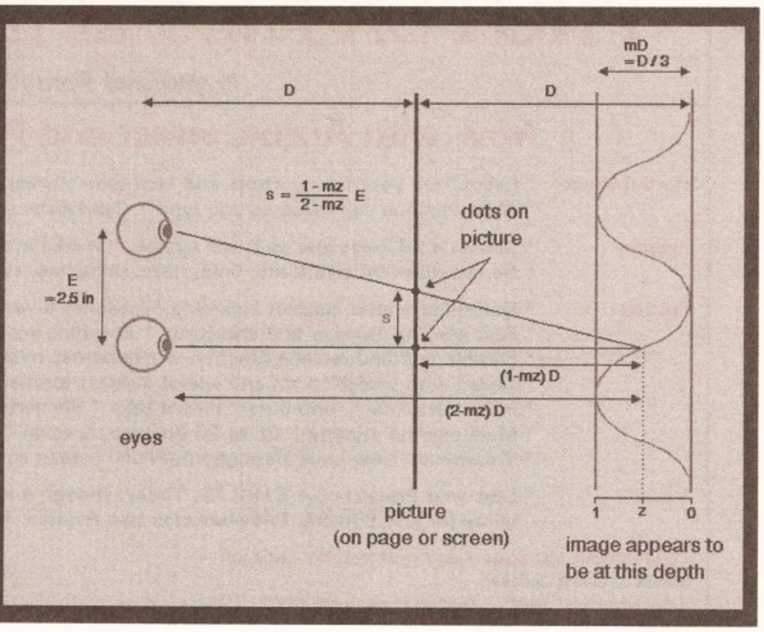
Traditional methods of displaying 'three-dimensional' images rely on somehow displaying separate images to each eye. Remember those red and green glasses that you got free with comics? And those old ViewMaster toys that looked like a pair of red binoculars and came with a selection of pictures on cardboard discs?

Random dot stereograms (RDS) were first created back in the 1960s by a guy called Bela Julesz. He invented them to demonstrate how a sense of depth could be produced solely from

stereopsis, without any other cues such as perspective. Bela Julesz used two separate images made of random patterns of dots which didn't look like anything at all when viewed separately. However, when the images were viewed in stereo, using a special piece of equipment (just like that ViewMaster toy), they created an impression of depth. This demonstrated how good the brain was at matching corresponding features in two images from the eyes to produce a 3D picture of a scene.

More recently, in 1990, two people called Tyler and Clarke, realised that it was possible to merge together the two images from one of Julesz' RDS to form a single image. This image, when viewed in a special way, produced the same depth effect, but without needing any special equipment. These are the SIRDS you see today.

You've been had! Random dot Stereograms fool your brain into thinking it's looking at a real object. It's all to do with having two eyes. Anybody with more than two eyes probably won't be able to see them. Nor will anyone who has eyes which look like this...



THE PROGRAM

For space reasons the listing program on page 72 has few comments and isn't very user-friendly, however, it works. It uses a more sophisticated method than most public domain SIRDS generators and produces more correct images.

The program has a built-in test formula that generates a pattern that looks like an egg box, in fact, it's a sine wave in two dimensions. When you first run the program it generates a SIRDS using this formula. The program is not exactly fast but Turbo extension users can replace the 'Point' and 'Plot' functions with their Turbo equivalents 'F Point' and 'F Plot' for a slight increase in speed.

Once you have generated and seen this test pattern you can start creating your own SIRDS. Change the line that reads 'TEST=True' to 'TEST=False' and the program prompts you for a depth map picture (a standard IFF picture but where each pixel represents a depth into the screen). You can create a depth map using Deluxe Paint or your favourite paint program. The depth map picture must have the same resolution as the output image (640 x 256 pixels in the program as it stands), but it can have any number of colours.

Set the first colour in the palette to black and the last colour to white. Then use the spread button to produce a smooth spread of greys between black and white. Black now corresponds to the farthest distance into the screen and white corresponds to the same level as the page. So the darker the colour the deeper behind the page the point appears in the final image.

However, the number of different levels of depth that you can produce in the final image is limited: the exact number is equal to Fn separation(0)-Fn separation(1) and is dependent on the output resolution. The higher the resolution, the more levels of depth you can produce.

GOOD RESOLUTIONS

The DPI variable in the program determines the horizontal resolution of the output in dots per inch (DPI). It needn't be exact, but you can measure the width of the picture on the screen, or on paper in inches, and divide this into the width in pixels. On my monitor, a high res screen is about 70 DPI and a low res screen about 35 DPI. The SIRDS you see on the opposite page should be about 125 DPI.

The 'HIDDEN' variable is a flag that controls the hidden surface removal. You can switch it on by changing this to 'True', but it does slow down the program. This is only necessary for scenes where there are sudden changes in depth (for example, the Amiga Shopper logo) and prevents spurious 'echoes' from appearing in the image

The easiest way to print out the stereograms is to save them as IFF pictures and then print them from Deluxe Paint (or your favourite paint program). Remember to set the DPI in the program for the size you are printing the image at.

As it stands, the program uses eight shades of gray to draw the SIRDS, but you can change it. Obviously, the minimum number of colours you can use is two (black and white) but you could have 32. Most commercial SIRDS are coloured and textured with nice patterns rather than just being random dots. This is done purely for artistic reasons, but doesn't really add much to the effect.

It is quite easy to alter the program to produce textured SIRDS: simply add some code to load in an IFF picture containing the texture and change the program so that, rather than choosing a random colour, it takes the colour from the corresponding point on the texture. Note that for this to work properly the texture must be fairly rough and non-predictable: the fractal plasma clouds from July's Amiga Shopper make ideal textures and the picture below demonstrates SIRDS textured with a fractal plasma cloud.

YOUNGER GENERATIONS

You can also try generating a number of different SIRDS of the same image (with different random numbers). Display each of these images in quick succession, produces an interesting 'shimmering' effect which can make the SIRDS much easier to see. Colour cycling SIRDS can also produce some disconcerting effects.

So unfocus your eyes and enjoy!



This is what happens when you run the SIRDS program on the Amiga Shopper logo shown on page 71. (Personally, these just give me a headache – Ed.)



The fractal plasma clouds produced in AMOS (from the July AMOS Action column) are ideal for converting into SIRDS, as long as your brain can cope...

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AmigaDOS

Libraries are a great source of confusion – Mark Smiddy explores the mystery surrounding transient loaded functions.

Did you know that the Amiga's operating system is over 1Mb of code consisting of hundreds of different functions? You may already know a large amount of that code is stored in the 512K of ROM, but what you may not have realised is that the rest is stored on floppy disk. Hundreds of pre-written functions all ready for immediate use are already on your machine and in this feature I'll be explaining the techniques involved without being too language specific so even if you have only the most basic knowledge of programming you should have an appreciation of what libraries are.

First though, a quick trip back to basics. Let's examine what a library actually is. Collins' Dictionary defines a library thus: "1. a room or set of rooms where books and other literary materials are kept." It goes on to mention the computer definition as: "5. a collection of standard programs and subroutines for immediate use.

Usually stored on disk or some other storage media." A storage media can be any permanent store – be that ROM or disk and this simple definition does not presume to differentiate between library types. I'll return to that topic shortly, first let's take a close look at the theory behind libraries.

Like many inventions, computers have evolved over a period of some years. Things have come a long way since Charles Babbage first described the linear computer and John von Neumann pioneered high-speed techniques. Computational power that used to fill a room now fits in the palm of your hand; power that fits on your desktop wasn't even possible forty years ago!

Inevitably perhaps, microelectronics have advanced faster than the abstract art of programming; but several philosophies have become synonymous with good programming practice and libraries are one of them. The idea stems from the more basic premise that many programming tasks are repetitive and any task can be sublimated into many smaller sub-tasks (which can be divided into smaller tasks and so on) and from this the subroutine was born.

SUBROUTINES

Imagine a program to make a cup of tea. The program has one command, which we might write:

```
MAKE TEA
```

This makes a lot of assumptions: not least that the computer even knows what tea is (it doesn't need to know about trained chimpanzees or the history of the East India Company). So we'll break it down into smaller sub-tasks:

```
    PROGRAM: MAKE TEA
1. ADD ONE TEABAG TO MUG
2. ADD WATER TO KETTLE
3. SWITCH ON KETTLE
4. WAIT FOR WATER TO BOIL
5. ADD BOILING WATER TO MUG
6. WAIT FOR TEA TO BREW
7. REMOVE TEABAG
8. ADD MILK TO MUG OF TEA
9. ADD TWO LUMPS OF SUGAR TO MUG OF TEA
```

I've been quite explicit in the use of language here so you can spot the common factors. Two verbs (commands) crop up several times in this program: "ADD" and "WAIT". This program could conceivably be further sub-divided into many more functions, but the same thing crops up at every level: certain tasks need to be done regularly and the things they act on are merely parameters. Let's take WAIT as an example.

```
4. WAIT for water to boil
6. WAIT for tea to brew
```

WAIT is the function, it's acting on the kettle and the teabag in these steps, but it could just as easily be waiting for a tea-break. It triggers the next action in a series of events. When the kettle is being filled, by ADD, it could read:

```
2.1   TURN tap on
2.2   WAIT until kettle is full
2.3   TURN tap off
```

REMOVE is also a function: at a lower level in this program it could describe:

```
1.1   REMOVE one teabag from tea caddy
9.1   REMOVE two sugar lumps from sugar bowl
```

SIZE AND USE

Of course, these functions could be added to the program code directly as required. This linear, top-down programming is very size inefficient (but slightly faster). Let's assign some arbitrary sizes to these routines.

Function	Size
ADD1	50
SWITCH	50
WAIT	20
REMOVE	150

Taking no account of the rest of the program, if we code this in a linear fashion the program will be:

```
150+150+50+20+150+20+150+150+150
=990 units
```

If, on the other hand, we only have one copy of each routine used then the program's size will be the total of all the functions, thus:

```
150+50+20+150
=370 units
```

This simple analysis does not take account of the extra programming required to implement the sub-routine calls, but it shows the dramatic improvement in physical code size. Applying this to computers, imagine the program to display a single letter on the screen was ten steps long; now imagine you wanted to display 1000 characters.

Using linear code this would require 10,000 steps! With a simple loop and a ten step subroutine, the whole thing could be done in less than 20. (As an aside, it's worth noting the original 32K ROM for the BBC Micro contained a massive section of linear code just like this to clear screen RAM during a mode change.) Writing a character is such a common function, it should come as no surprise it's available in the operating system. In fact, the function appears in different libraries at increasing levels of complexity: the simpler functions call the more complex ones eventually reaching a "primitive" function which addresses the hardware.

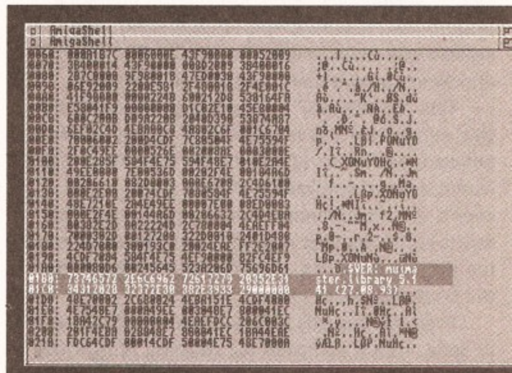
AmigaDOS commands are, in effect, a library of functions which provide user access to the AmigaDOS library. Take MAKEDIR for instance. It processes the command line using a function in the DOS library (which gets the line input from the "console.device" which itself calls intuition.library), then uses another library call, "MakeDir" which eventually calls "trackdisk.device" to write the appropriate information to disk.

Such functions are common to many commands: MakeDir for instance is used by COPY when it creates sub-directories for recursive copies. If the Amiga didn't make such extensive use of libraries, the operating system would require dozens of disks and megabytes of memory.

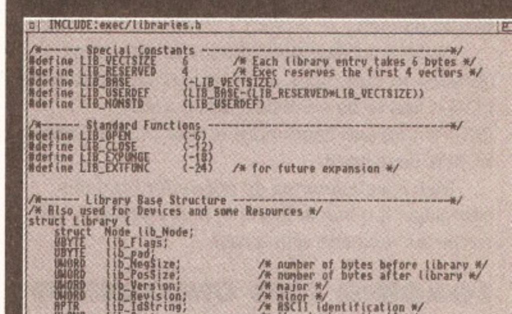
Clearly, not all these functions are needed by all programs: and this is where the library analogy comes in. You can think of any library as being like a conventional public library: not every person will need every single book. The "books" or functions are shared between everyone that needs them.

INTERNAL AND EXTERNAL LIBRARIES

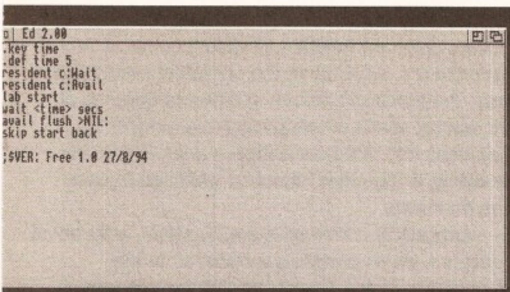
Now that we have some understanding of what a library is, it's time to look at how these things are rationalised in a real system. In a perfect world, the programmers would have thought of everything, written the code for it and put the whole lot in ROM where it can be accessed quickly and easily. Unfortunately, there's only a limited amount of



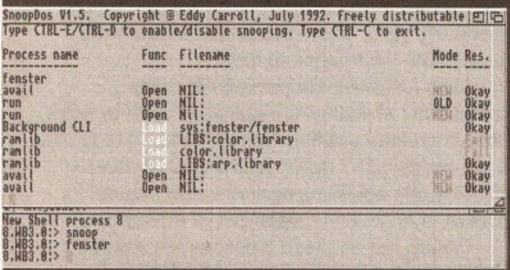
A few of the more modern libraries have version codes inserted like in ASCII (highlighted in this HEX dump). This is the "MuiMaster.library" part of the underrated Magical User Interface.



Library base code is very complex. This is part of a C language "include" file that describes the most basic parts of a library base structure.



Editing the FREE script. Note in this version I have added a Version string like this: "$VER: Free 1.0 27/8/94".



Eddy Carrol's SnoopDOS, an excellent utility for tracking down strange DOS functions shows "Free" at work. In between Free calls, the screen grabber, "Fenster" was started to demonstrate it really is working.

space in ROM (512K in the current release) and it's rather permanent too – I'll look at this shortly.

For this reason the Amiga has two library types: Internal–those already in ROM and external–stored on disk. So what go where? In a real system the ROM only NEEDS to contain a small amount of "bootstrap" code to perform simple system checks such as RAM configuration and possibly some simple diagnostics before loading the operating system from mass-storage (usually disk). This system was employed on the first Amiga A1000 and even on developer A3000 machines too.

This "Write Once" memory is protected either by a simple memory management unit or special software and works just like normal ROM. In other words, normal software can't just go stomping all over it. A more permanent (and safer) solution is employed in the vast majority of machines where the system is loaded onto ROM and activated by the bootstrap reset code.

Even so, this still only accounts for 512K worth of code. That's sufficient for Intuition, AmigaDOS and a whole host of graphics and sound functions, disk drivers and so on. But many functions are not needed most of the time – extended floating-point mathematics are a good example. So, rather than waste the precious ROM space, these libraries are placed on disk.

There's another good reason to put extra libraries on disk: bugs. If a bug is discovered in the ROM it has to be corrected with a patch (SETPATCH) and users have to wait until the next ROM is developed.

Disk-based libraries do not suffer from this pathology: if a bug is found in a disk library it can simply be replaced with a new.

LOADING AND UNLOADING

All libraries are accessed by a call to an EXEC function (in the exec.library). In pseudo-code, a typical open call looks like this:

```
LibBase =
OpenLibrary("libname.library",version_number)
IF LibBase = 0
   SAY "Library failed to open!"
   QUIT
ENDIF
```

The EXEC library is always available and its base address is the only constant in the entire Amiga system! EXEC manages everything from RAM allocation to devices and tasks. At this stage it is important to look at what happens when a program asks EXEC to open a library. Several things can happen:

1. The library is already open. In this case EXEC increments the library's "use" counter and passes the address of the library's "base". (It's similar to the "Use Count" returned by the RESIDENT command.) This counter keeps track of the number of tasks allocated shared use of the library functions. Many libraries are opened by the system automatically as the machine boots: "dos.library" and "intuition.library" are two that spring to mind. Note: if a library is already open, EXEC does not care if it came from disk or ROM.

2. The library is not open. EXEC checks the library name and consults the internal list of ROM libraries. If the name exists the library is "opened": a library base is created in RAM and the vector table copied there. EXEC returns the entry point to the library as a 32-bit address pointer. These tables take a finite amount of room which you can approximate as the number of functions times six plus 24 bytes. The AmigaDOS 2 vector table occupies around 900 bytes of RAM. (The library "base" itself takes even more – but that is too specific to detail here.)

3. The library cannot be found in the system list. EXEC calls AmigaDOS and attempts to load the library from disk ("diskfont.library", "commodities.library" etc.) from the current LIBS: assignment. (Fiddling around with this assignment can have some very interesting effects if you make it point at a disk that lacks a necessary library.) If the library cannot be found on disk either, EXEC returns a "NULL" pointer to the calling program, which should exit gracefully: some folk still don't check this!

I've simplified the opening sequence at this stage because something more important is happening. External libraries are loaded from disk *in their entirety*! EXEC doesn't know in advance which functions you're going to need so it attempts to allocate sufficient memory and load the whole library into RAM. (Once loaded, libraries can allocate their own memory and do all sorts of clever little things. If any of these fail, EXEC returns a NULL pointer and clears the library from memory: technically this is called "expunging".)

CLOSED LIBRARY PATHOLOGY

The last thing any program should do before exiting is return all resources to the system: that includes de-allocating RAM and closing libraries. A funny thing happens here: provided a valid CloseLibrary call is made, EXEC decrements the libraries "use" counter. When the use counter gets back to zero, the library is marked for removal: but nothing more. Even if a diskloaded library was opened by a single program, used once, then closed: it's still hanging around in memory. ROM libraries aren't quite as bad: but the jump table and library base do take up a certain amount of room.

At first sight it may seem ludicrous to have memory used by "dead" libraries. But this is not as daft as it sounds. This allows a program to open and close a diskloaded library at will without EXEC having to load it from disk every time. Individual programs are more guilty of this than others. Large applications such as "Imagine" (and other complex rendering programs) are great culprits. They open lots of external libraries and (by nature of EXEC's design) leave them hanging around in memory even after they've quit!

This situation is not as dreadful as it sounds you can force EXEC to clean up memory (a technique bluntly called "garbage collection" in early BASICs) from either AmigaDOS or Workbench. Officially, the Amiga term is "flushing", personally I prefer the earlier term. From Shell the command is simply:

```
1>AVAIL FLUSH
```

Note: KingCON (the CONSOLE: replacement) gobbles a little bit of memory for its history every time a command is executed so it should be temporarily switched off if you intend running any tests with AVAIL!

To access this function from Workbench, you must supply the "-DEBUG" switch to the LoadWB command in the Startup-sequence, viz.:

```
LoadWB -DEBUG
EndCli >NIL:
```

This adds an extra "Debug" menu to Workbench containing two items: ROMWack and flushlibs. Selecting "flushlibs" has the same affect as AVAIL FLUSH command; ROMWack activates the serial ROM debugger and will effectively crash the machine unless you have a serial terminal attached and know how to work it!

VERSION NUMBERS

The operating system library is constantly being improved and most of us experience this through the various releases of Kickstart. The earliest still in use is V1.2, but most machines are now fitted with V2.04 or V3.0. The version numbers that we know are different to the internal versions. For example, Kickstart 2.0 has an internal version number of 36; Kickstart 2.04 is V37 and Kickstart 3.0 is V39. In addition, each version has a revision number associated with it too. You can see this using VERSION:

```
1>VERSION
Kickstart version 39.106. Workbench version
39.29
```

Curiously enough, EXEC does not care about a library's revision number. The OpenLibrary call only reads the version number. The following pseudocode would attempt to access the Workbench 2.04 Intuition library.

```
IntuitionBase =
OpenLibrary("intuition.library",37)
IF IntuitionBase = 0
   SAY "Requires Workbench 2.04 or higher!"
   QUIT
ENDIF
```

Something to watch out for here is that EXEC differentiates between upper and lower case. Some very annoying bugs can be traced to calls along the lines of:

```
IntuitionBase =
OpenLibrary("Intuition.library",37)
```

Commodore's programmers' guidelines also explicitly state that all code should check for correct library returns before attempting to call a function. Digita's programmers fell into this trap with early versions of Wordworth 3 by testing for a version 37 of a ROM library and assumed that all other libraries were compatible.

Generally speaking this should have been the case, but some dodgy hard disk installation programs have been known to copy standard libraries wholesale. This problem does not rear its ugly head until something actually requires a later

version. Tracing the culprits is never easy, but period checks of your hard disk libraries and devices should ensure everything is as it should be. A simple check can be performed from AmigaDOS thus:

```
1>SPAT VERSION LIBS:#?.library
```

You can do the same thing for devices and commands too:

```
1>SPAT VERSION C:#?
1>SPAT VERSION DEVS:#?.device
```

Note: very few third party commands include a version string but all libraries MUST have a version number. A list of current version numbers should be checked against your original disk set: given the number of different releases it would be futile to attempt to list them all here.

LEAGUE TABLE OF REDUNDANT LIBRARIES

Our league table of redundant libraries shows some surprising results. These calculations were performed using Workbench "Flushlibs" as described calculating the amount of memory left after the program had been launched and immediately quit. The results are quite surprising: but note this is an Amiga feature and should not be viewed as a fault on the programmers or some deficiency on the application. The "AutoFree" script can help enormously.

WORDWORTH 3	540K	FINAL WRITER	180K
PERSONAL PAINT	48K	OFFICE 2 PAGE	3.5K
AMOS PRO	1K	OFFICE 2 CALC	<1K
SUPERBASE 4*	<1K	SUPERBASE 2*	<1K
SUPERBASE PERSONAL	0K	DPAINT	0K

* Abnormal exit

MISUSED VECTORS

The term "vector" is one of the most misused in computing. Although the term is not strictly accurate when applied to function libraries, it will do and in this sense it means to re-direct the course of a program. Vector tables used in this way are sometimes called "jump vectors".

This elegant idea provides a simple way to access any function in any library without having to know its actual location (absolute address). The great advantage of this system is the program jumps to the sub-routine by jumping through the vector which diverts it to the correct address in ROM or RAM. Why? ROMs are subject to change and you can never know where a RAM based library is going to end up! At the end of the function a simple "return from subroutine" instruction returns back to original position in the program. (All modern languages have function calls that work in just this way).

There's another advantage to storing the vector table in RAM: functions can be intercepted and re-directed to some other code. This technique is widely used to patch bugs in Kickstart and provide special functions such as animated requesters for programs like ARQ, or allowing a virus checker to check disks when they are inserted.

It's worth noting that the libraries function vector table starts 30 bytes before its base address. Every function is accessed by a negative offset from the base: called an LVO – or library variable offset. There isn't sufficient room to describe why here, it just works that way.

LINKER LIBRARIES

The libraries just discussed are universally called "shared libraries" and most languages (including BASIC) support some way of accessing these. There is another type only used by specialist languages like C and Assembler: linker libraries. These contain functions not supported by standard shared (ROM) libraries and usually comprise language specific functions.

C compilers, for example, are usually supplied with several linker libraries containing machine dependent code for standard "core" functions. This allows the compiler to generate generic code which is read by a linker on the target machine. C proponent's use this characteristic when describing it as a machine independent language. What they don't say is the same could be true of any compiler: be it FORTRAN, Pascal, or Oberon. Even a compiled BASIC could be this portable.

Core functions are things with grandiose names like "standard I/O" – abbreviated to STDIO. But these functions are often so simple they're about as much use to modern computers as a chocolate fireguard. Standard I/O covers functions such as, "get a character from the keyboard" and "display a formatted string on the terminal". Functions to handle windows, menus and high-resolution graphics remain machine dependant.

Perhaps the worst feature of linker libraries is that they're often very memory inefficient. The C function "Printf" displays a text string on the current output stream: usually the console; but it has a great number of completely superfluous functions. Depending on the implementation of the linker and the library, a simple C program to display "Hello World" could be over 10K long! That's because the linker copies entire chunks of code from the library into the target program.

Shared operating system libraries are far more efficient, since there's only ever one copy of any particular function in the machine at any one time: this is a particularly thorny problem for a multi-tasking operating system where many programs are duplicating exactly the same code. The standard I/O situation had become so unsatisfactory by Kickstart 1.3, Commodore threw convention to the wind and included these functions in the AmigaDOS ROM library.

THE GLOBAL VECTOR

The Amiga has a strange history and one of the most unusual stories was the development of AmigaDOS itself. Unlike the rest of the operating system, AmigaDOS was originally developed in an unusual language called BCPL. BCPL shares some similarities with C, in that it can vector access routines, but most of the original code was handled by private library functions. For AmigaDOS, this was known as the "global vector table" and only BCPL programs.

The global vector allowed BCPL AmigaDOS programs access to functions such as the command line interpreter and pattern matching. They were not available to C programmers: and as far as I know, no practical documentation exists on its implementation.

Anyone who has attempted to code these algorithms from scratch will tell you they're a real bind. Pattern matching is a particularly thorny one and this explains why most third-party programs avoided the problem altogether and used linker library functions supplied with their compilers.

The global vector table is still supported by AmigaDOS: you can see it in the STATUS command like this – but for most of us, it's little more than a curiosity:

```
1>STATUS 1 FULL
Process 2: stk 4096 gv 150 pri 0 loaded as
command: IPrefs
```

STATUS returns the size of the global vector table, "gv", as 150 (bytes presumably; vectoring to 25 or 36 different functions depending on how you count it). It always has, as far back as I can remember, and it will most probably always stay that way. In some future release it might get dropped altogether.

IN SUMMARY

What does all this tell us about the Amiga? It's a powerful and very underrated machine that has suffered from dreadful marketing and survived a few false-starts to become a shining star among home micros. Perhaps the most important lesson to be learnt is when memory starts to get tight, try flushing those unnecessary libraries before resorting to a reset. Remember, even if a program fails to start, any libraries EXEC loaded for it will remain in memory even if nothing else needs them.

Given that an increasing number of third-party applications come with their own shared libraries (Wordworth 3 is a good example) they will cause the same side effects. Flushing memory after running Wordworth 3 recovered a staggering 540K!

I'm sure Wordworth uses shared libraries in preference to linker libraries for a very good reason: probably for advanced, multi-tasking documents. However these libraries will not be automatically flushed by the program when it exits: that's EXEC's job.

Don't be forced into thinking shared libraries are a short cut; they're far more difficult to construct than a linker library and even programmers don't want to make life more difficult than it already is. AS

AUTOFREE

AutoFree is a simple AmigaDOS script that you can call from the Startup-sequence to keep those unused libraries from clogging the machine. By default it waits for 30 seconds, flushes all unused libraries and starts again. You can supply a longer (or shorter) time, by altering the value of line two, if you prefer. AutoFree runs in the background and takes very little memory in itself: the version listed here is for Workbench 2/3 but it could be modified for earlier machines by making SKIP and LAB resident. The script should be saved in the S directory of your boot disk and called from User-startup like this:

```
RUN <NIL: >NIL: EXECUTE AutoFree >NIL:
```

LISTING

```
1. .key time
2. .def time 30
3. resident c:Wait
4. resident c:Avail
5. lab start
6. wait <time> secs
7. avail flush >NIL:
8. skip start back
```

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Macclesfield Computer Club (Est 1983). Contact D. Latham (chairman) ☎ (0625) 615 379, Fax: (0625) 429 667. c/o Grantham House, Macclesfield, Cheshire SK10 8NP.
Oswaldtwistle Hyndburn Amiga Users Club. Contact Nigel Rigby ☎ 0254 395289.
Skelmersdale Computeque. Contact Steve Lalley ☎ 0695 31378.
Stamford Under 18 Only. Contact Joe Locker ☎ 0780 64388

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Bathgate Lothian Amiga Users Group. Contact Andrew Mackie, 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR.
Cowdenbeatrh Amiga FX. Contact Ryan Dow ☎ 0383 511 258.
C.P.C. User Group, Alistair Lyons, 18 Braehead, Bo'ness, West Lothian, Scotland, EH51 9DN.
Dundee Tay-Soft PD Club. Contact Dave Thornton ☎ 0382 505437.
Dunfermline Dunfermline Sound & Vision Club. Contact Stan Reed, 7 Maxton Place, Rosyth, Dunfermline, Fife KY11 2DG.
East Lothian Amiga Club (every 2nd week). Derek Scott ☎ 0620 823137, (Saturday 1 – 4pm). Bridge Centre, Poldrate, Haddington, East Lothian, Scotland.
Edinburgh Edinburgh Amiga Club. Contact Stephen Fradley ☎ 031 555 1142.
Edinburgh Edinburgh Amiga Group. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE.
Glasgow Amiga Helpline. Contact Gordon Keenan, Amiga Helpline, 6 Skirsa Square, Glasgow G23.
Hawick Borders Teri Odin BBS. Derek Scott, 0450 373071. 26d Harden Place, Hawick, Borders, Scotland.
Inverness Highland PD.Contact David Paulin ☎ 0463 242431.)
Johnstone Using AMOS. Contact Colin McAllister ☎ 0505 331342.
Perth Perth and District Amateur Computer Society. Contact Alastair MacPherson 137 Glasgow Rd, Perth.
Redburn Redburn Computer Users Group. Contact Ruby Anderson ☎ 0294 313624.
W. Lothian Amiga Computer User Club. Contact Alistair Lyons, 18 Braehead, Bo'ness, W. Lothian, Scotland EH51 9DN.

WALES

Bangor Amiga Maniacs. Contact Johnny, 8 Tan-y-

Grais, Caernarfon Rd, Bangor LL57 4SD.
Carmarthen Bloomfield Video and Computing. Contact Mrs Beryl Hughes ☎ 0267 237522.
Clwyd ShieldSoft PD. Write to 26 Doren Avenue, Rhyl, Clwyd LL18 4LE, ☎ 0745 134 3044.
Clwyd Solo (Amiga). Contact Mike, 26 Doren Avenue, Rhyl, Clwyd LU8 4LE. ☎ 0745 343044
Neath Amiga Navigation. Contact Dave Thomas 4a, Allister St, Neath, W Glamorgan.)
Powys Blue Bedlam. Contact Michael Grant ☎ 0873 811791.

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N Ireland N. Ireland Amiga User. Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS.
N Ireland Digital Intensity (diskmag). Contact Simon Denvir, 40 Old Cave Hill Rd, Belfast BT15 5GT.

BBSs

Amiga Buzz BBS. Contact David Clift on ☎ 0924 491 461.
Animeiga UK BBS Contact Chris Payne ☎ 0462 484 752 . 2400_14400 V32bis 8n1 24 hours a day/7 days a week.
Avenger BBS, Lincolnshire based board, opening times: Weekends 9pm 12am upto 14400 baud, Data ☎ (0507) 568318.
Bidwell BBS. Contact SYSOP Mark Lunt Modem ☎ 0582 863 906.
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Borders Teri-Odin BBS. Contact Derek Scott ☎ 0450 373 071.
Chiltern Amigas BBS, contact Commodore Specialists ☎ (0296) 87522. 14400BPS, 37 Plough Close, Aylesbury, Bucks, HP21 9AD.
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SPECIAL INTERESTS

Amiga Sports Fans. Contact Jamie Last, York House, Church Road, Elmswell, Bury St Edmunds, Suffolk, IP30 9DY.
Angus Amiga Musicians Club. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus.
Basingstoke AMOS Programmers Exchange. Contact J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD.
Branston Fen Amiga Boatowners. Contact D Beet Lock, Branston Fen, Lincolnshire LN3 5UN.
Braunston Nr Daventry GFA Basic Forum. Contact J Findlay ☎ 0788 891197
Braunston, Nr Daventry Amiga E Support Group. Contact John Findlay ☎ 0788 891197.
Broadstairs AMOS Programmer Club. Contact Gareth Downes-Powell, 6 Brassey Avenue, Broadstairs, Kent CT10 2DS.
Chelmsford Independent Commodore Products Users Group. Contact David Elliott ☎ 0245 328 737
Glasgow 24-bit Club. Contact Gordon Keenan, 24-bit Club, 6 Skirsa Square, Floor 1, Glasgow G23.
Highfields CDTV User Group. Contact Gary Ogden, ☎ 0785 227059.
Lingfield In Touch Amiga. Contact P Allen, ☎ 0342 835530, PO Box 21, Lingfield, Surrey RH7 6YJ.
London (Richmond) Micro Academy. Contact Don Pavey ☎ 081 878 1075.
London Independent Commodore Products Users Group. Contact the Membership Secretary (Fax ☎ 081 651 3428). ☎ 081 651 5436
Lothian Independent Commodore Products Users Group. Contact David Hope ☎ 0555 811 955..
Macclesfield Independent Commodore Products Users Group. Contact Peter Richardson ☎ 0298 23644
Maidenhead Independent Commodore Products Users Group. Contact Mike Hatt ☎ 0753 645 728.
Manchester CDTV Users Club. Contact Julian Lavanini, 113 Fouracres Rd, Newall Green, Manchester M23 8ES.
New Whittington Digital Music Club. Contact Roger Hunt ☎ 0246 454280.
Normanton BASIC Programmers' Group. ContactMark Blackall ☎ 0924 892106.
Rochford Ray Tracers. Contact Neil Hallam, 12 Meesons Mead, Rochford, Essex SS4 1RN.
Romford Phoenix Demo. Contact Frank ☎ 081 597 4661.
Rotherham Marksman (Trojan Phazer user group). Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB.
Solent Independent Commodore Products Users Group. Contact Anthony Dimmer ☎ 0705 254969
Swindon Amiga Video Producers' Group. Contact J Strutton ☎ 0793 870667 before 9pm.
Swindon MUG – MED Users Group. Contact Richard Bannister, 6 Glevum Rd, Stratton St Margaret, Swindon SN3 4AF.
Wallington Bible Bureau.Contact AD ☎ 081 669 7485.
Ware Gamer-Link. Contact Stu, 28 Churchfield, Ware, Herts SG12 0EP.
Witham Video Visuals. Contact Chris Brown, 4 Lavender Close, Witham, Essex CM8 2YG.
Workington AMOS Programmers Group. Contact John Mullen at 62 Lonsdale St, Workington, Cumbria CA14 2YD.

OVERSEAS

Australia Southern Suburbs Commodore Users Group, Steve Perry, P.O. Box 217, Beverley Hills 2209, Sydney, N.S.W. Australia.
Australia Amiga Users Group of Western Australia. Contact Bill Sharpe-Smith PO Box 595, Clover- dale WA 6105 Australia.
Australia Comp-U-Pal. Contact Comp-U-Pal, 116 Macarthur Street, Sale, Victoria 3850, Australia.
Belgium AUGFL vzw. Contact Lieven Lema, Meesberg 13, 3220 Holsbeek, Belgium.
Denmark Danish AMOS user group. Contact Tom Poulsen, DABG, postbox 127, 2640 Hedehusene, DK Denmark.
France 16-32 Micro. Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 315220 02.
France Maritime Amiga Club. Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447.
Germany Royal Air Force Amiga Club. Contact Stan Young, HMF RAF Laarbruch, BFPO 43.
Germany Worldwide PD Club. Contact Dave White, Berliner Strasse 39, 40880 Ratingen, Germany ☎ 02102 499729 (Germany).
Gibraltar Gibraltar Amiga Users Club. Contact David Winder, 7 Lime Tree Lodge, Montagu Gardens, Gibraltar ☎ 010 350 79918.
Greece Amiga Athens club. Contact Stefanos Papamichael, 9 Derfeld Rd, Patisia, 11144 Athens, Greece ☎ 01/2027973.
Greece Amiga Pros User Group Greece. Contact Stefanos Siopoulos, 52 Silivrias Str., N. Smymi 17123, Athens, Greece, ☎ 01/9349963.
India Indian Amiga Friends. Contact Bilal, 46 Paragon 405 Lokhandwaza Complex, Andheri (W), Bombay-400058.
Ireland Amiga Addicts. For info SAE to A Minnock, Clonkelly, Binn, Co Offaly, Ireland.
Ireland AMOS Users.Contact Brian Bell, 8 Magnolia Park, Dunmurry, Belfast BT17 0DS.
Ireland City Centre Amiga Group. Contact Patrick Chapman, 70 Ballygall Crescent, Finglas East, Dublin II, Ireland, ☎ 345035.
Ireland CUGI Commodore Users Group of Ireland. Contact Geoffrey Reeves, c/o St Andrew's College, Booterstown Avenue, Blackrock, Co Dublin. ☎ +353 1 288 3863.
Ireland Navan Computer Club. Contact Mark Arnold, Cannistown, Navan, Co Meath, Eire ☎ 046 21078.
Ireland Northside Amiga Group. Contact William Kelling, 10/A Rainsford Avenue, Dublin 8, Ireland ☎ 01 532 807.
Ireland Software Exchange Club. Contact Michael Lacey, Fern's Post Office, Enniscorthy, Co. Wexford, Republic of Ireland.
Malta HTS (Malta). Contact K Cassar, Block 1 Flat, 6 H E Hal-Tmiem, Zejtun ZTN07 Malta ☎ 674023.
Malta Malta Amiga Club. Contact Zappor, PO Box 39, St Julians, Malta, ☎ 440453
Portugal. Centro Amiga/Via Lactea BBS, Rui Costa, 351 01 888 2245/49, Largo do Martim Moniz-C,C, Mouraria, 1 loja 408-1100 Lisboa, Portugal.
Portugal Software Asylum. Sid Sanches, Portugal ☎ 062 831566. Apartado 6156, 3000 Coimbra, Portugal.
Singapore Singapore Sling. Contact Eric Chai ML, Block 4 #14-413, Pandan Valley, Singapore 2159, ☎ 65 4680630.
South Africa Amiga Users Exchange (AUX). Contact Ken Turner, 24 Du Plessis Avenue, Edgemead, 7441 Cape Town, S. Africa. Internet: kturner@aztec.co.za
Sweden 32-bit ware. Contact 32-bit ware, Ekorrstigen 10, 147 63 Tumba, Sweden.
Switzerland Amiga User Group Switzerland (AUGS) Contact AUGS ☎ ++41 34 45 3078. Bahnhofstr. 7, CH–3426 Aefligen, Switzerland. BBS: +41 (0) 62 44 32 27. We have our own Net on several Swiss Amiga BBSs called "AUGS-Net".
USA Japan Amiga Group.Contact: Rick Gardaya, PSC 78 Box 3876, APO AP 96326 USA.

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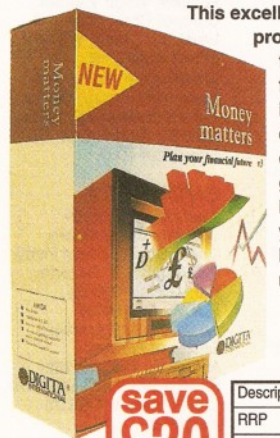
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Money Matters 3



This excellent home accounts program is easy to use, flexible, powerful and fast. *Money Matters 3* includes features that enable you to view the data in the form of graphs or pie charts to help you keep track of your cash. Don't get lost in the money maze!

save £20

Description	Money Matters 3
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Blitz Basic 2



This powerful and flexible *BASIC* programming language from Acid Software has faster compiling and coding, new commands, and everything from *C* structures to an online assembler. This package comes with a manual, a user guide, four issues of the *Blitz User Mag* and five disks full of *Blitz Basic* games extensions, and examples.

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Description	Blitz Basic 2
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Wordworth 2

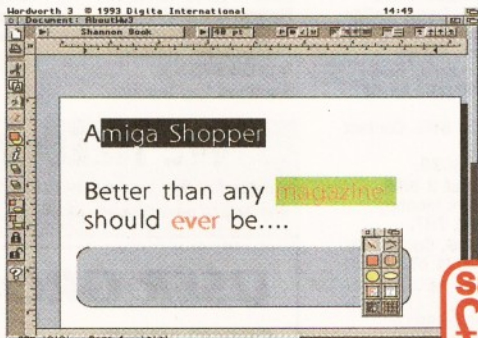


Although it has now been overtaken by *Wordworth 3*, this is still an excellent word processing program, especially at this price. *Wordworth 2* from Digita is a powerful, fast and packed with features such as Intellifont, which enables you to use fonts from 4 to 800 points in size, mail merging, a large dictionary and thesaurus, and an indexing system. An extremely powerful, flexible program which will suit nearly every Amiga user.

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Description	Wordworth 2
RRP	£129.99
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Wordworth 3

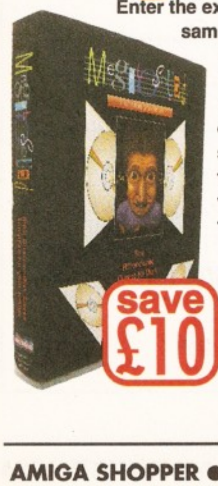


The third incarnation of this excellent Amiga word processor adds a compendious range of new features, including editable pop up gadgets, font sensitive requesters and a user editable tool bar which can be placed either along the top of the screen or the side.

save £50

Description	Wordworth 3
RRP	£149.99
AS price	£99.99
Order code	AMSWW3

megalosound



Enter the exciting world of sound sampling with MicroDeal's brilliant *Megalosound* sampler. *Megalosound* enables you to grab your own samples, edit them to suit your requirements, and then mess them up again with *Megalosound*'s many fun effects.

save £10

Description	Megalosound
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midi interface



Push your Amiga's musical capabilities to its limits with the fully-featured ProMIDI interface which enables you to connect synthesisers and drum machines to your Amiga and then use the samples with *Amiga Format's Music-X* and *OctaMED* Coverdisks.

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Technosound Turbo 2

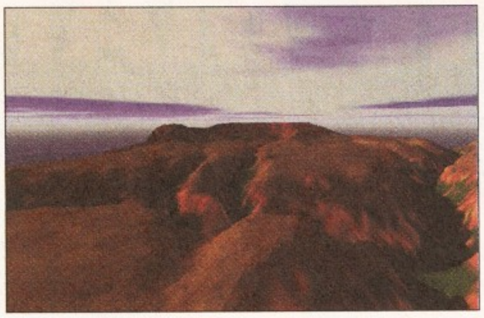


Like the original *Technosound Turbo*, version two of this sampler from New Dimensions enables you to grab digitised sounds and sequence them into compositions. But it also features many improvements and new functions, including direct-to-hard disk recording, and a built-in tracker. The package contains a digitiser and a set of audio leads.

save £10

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VISTA PRO LITE

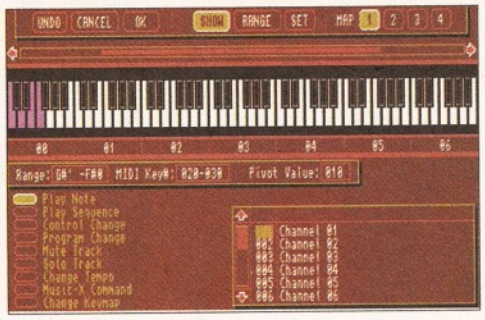


This amazing fractal landscape program from Meridian enables you to build your own scenery on your Amiga. Then you can animate it to create stunning fly-bys, or use it as backgrounds in your own games, pictures or 3D renders. And it even works on standard A1200s.

save £20

Description	Vista Pro Lite
RRP	£59.95
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Music-X 2



This sequencer package is one of the most ground-breaking releases since the original *Music-X* made such a huge impact in 1989. *Music-X 2* is a full MIDI sequencing package for controlling synthesisers, drum machines and other MIDI equipment, or you can use it with internal Amiga samples. The leading sequencer for the Amiga.

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SOFTWARE FOR FREE

Graeme Sandiford continues his search for the best in PD and shareware programs.

This month we will be pushing your limits of humour, knowledge, office efficiency and cuteness. We take a look at the latest issue of the insanely funny Lunchtime. Plumb the depths of the Mandelbrolt set. Find out more about the girls of Eric. Take a trip back in time to the land of the pharoahs. We will also take at the AGA version of VideoTracker a program that makes short work of making videos.

CORAL QUARREL (STARRING CHARLEY CAT)

Roberta Smith DTP

Coral Quarrel is a five-disk animation, created by Anthony Whitaker, that stars Charley Cat. Charley is a cute cartoon-style cat who decides to have a day out at the seaside.

This animation details the chaos that ensues as a result of this fateful outing. Things start off reasonably well, Charley arrives on the beach and sets up his huge amount of equipment. To keep the sun off, Charley has also brought a parasol, but the accursed thing won't stay open, this provides an excuse for all sorts of comic antics.

Anyway Charley decides to hang-ten, and charges off in his wet suit with surfboard in hand. While pulling several stylish poses he crashes headlong into a large post.

On returning to the beach Charley spies an attractive female cat. But she's accompanied by her boyfriend and this is where the real action starts. It comes thick and fast too, in true Tom and Jerry-fashion, with violent blows and tricks aplenty.

Well, that's as much as I am going to tell about the actual story. The quality of the animation is excellent, it's very fluid and well-drawn. The only thing you might want to consider, is that one or two scenes may be unsuitable for young children. But there is nothing in there that is any worse than you might find in a most children's cartoons. Because of the number of disks the animation is on, loading takes a heck of a long time. However, I think it is definitely worth the wait.

Product Rating 87%



Charley has never much luck with women, or with female cats for that matter. Catch up with him in his latest adventure, Coral Quarrel.

WORLD GEOGRAPHY

Magnetic Fields (ED037)

This disk actually contains two related programs, *World Geography* and *Geo Base*. Both of these programs have been written by Tony Kingsmill and was put together using AMOS, *DPaint 3* and the *World DataBank*.

World Geography is the more graphical of the two programs. It contains several maps that the user can navigate by pressing F1, F2 or F3. Pressing F1 will take you back to the previous picture, F2 will display information about the current map and F3 will move you onto the next map. One of the first maps that you will encounter is a rough map of the Solar system. While it was not drawn to scale or contain a lot of detail, does show all the planets in their relative positions to the Sun.

There is also a map of the world's oceans. This page contains some interesting information about the large bodies of water that cover the greatest part of our planet. There are also maps of the European Community and the UK, each of these areas waterways and major islands are also covered.

Geo Base provides geographical information about several countries. The information also includes details such as prominent mountains and major rivers.

As well as the geographical data, the program also contains information such as the main languages, primary religions and capital city. While the information contained in the database is quite detailed, there have been a few countries that have been missed out. For example there is no data on China, Turkey, Jamaica, Hong Kong, Korea or Iraq.

These are not particularly bad programs, but neither are they outstanding. They do contain some interesting information and would probably appeal to children between the ages of 7 to 10.

Program Rating 83%

TUTANKHAMUN

Essex Computer Systems

One of the subjects that I didn't enjoy at school, but have since developed a love for, is ancient history. It's fascinating stuff, learning about the Mayans, Aztecs, Egyptians, Romans, Turks and Greeks can be great fun. *Tutankhamun* is a licenseware (£5.50 for two disks) program that sets out to tell you all about this ancient Egyptian Pharaoh and a bit about the history of Egypt too.

It has been written in AmosPro and sports a simple-but-effective interface. In operation the program is very quick and there is little need for disk swapping. This is a clear sign of good program design, as a lot of the program's details are stored in memory and only things such as images need to read from disk. If you wish, you can also install the program to hard disk as well, although it runs well enough with two floppy drives.

The program is divided into six main sections: System, Chronology, Reference, Pictures, Diagrams and The Story. The System section contains an introduction to the program and Tutankhamun's burial site, instructions on how to use the program, a quiz and the preferences screen.

The Chronology section provides a timeline and details the rise of Egypt as a world power. It also places Tutankhamun's life and death in the stream of time and the time of the discovery of the Pharaoh's tomb.



Tutankhamun is a long dead Pharaoh. That's him on the right. It appears from his photo that he was actually made from gold – weird bloke.

The Reference section gives details of books, exhibitions, Egyptian society, dynasties of the Pharaohs and the curse that is said be protecting the tomb.

There are plenty of high-quality scanned images and diagrams. There 29 scanned in all, most are black and white, but there are few colour images too. The diagrams are mainly of the tomb and burial chamber, but also include detailed maps of both Egypt and the Kings Valley.

The Story tells of Tutankhamun's short reign and how his burial site was discovered and excavated. It details not only the events of the excavation, but the expectations and observations of those who uncovered it.

This is a very well-researched program that contains oodles of interesting and useful information. It is well designed and easy to use. The content is of high standard, both in terms of the images and the text files. I only wish they had this program while I was at school.

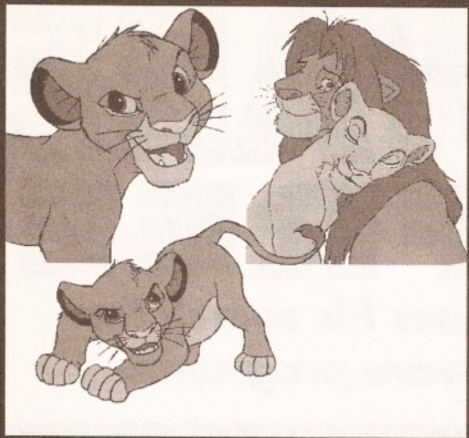
Program Rating 87%

MOVIEGUIDE V2.04

OnLine PD

MovieGuide is a database of recent films. The previous version of the program was a little "flaky", as a result its search functions did not always work as they should. It also lacked any details of the films' storylines. Version 2.04 sets out to make up for the short-comings the first revision

MovieGuide is a two-disk program which can also be installed to hard disk. It contains information about a surprising number of films. In essence it is a database program and is used in a similar manner. You can search for a film by either entering its title, director or the name of one



Here are some pictures of Simba the Lion King, the images of him as a kid are excessively cute.

of its cast.

If you have used a search criteria that produces a list of several films, you can also choose a sorting method. You can view the films by name, genre or by year. To reduce the searching time you can limit the program to a genre and a country of origin.

Once a list of films that match your criteria has been compiled, you can click on each film to view its director, cast and on some, a brief description of the plot. If you click on either the directors name or a member of the cast, the program will then direct its efforts to finding all the films that a director has directed or that a member of the cast has appeared in. You can also print out entries.

When I'd taken a look at this program before I was quite impressed, but disappointed by the unpredictable search function and lack of information about the films plot. Well, the search function has been fixed, but while plot information has been supplied with several films there are quite that have not. Maybe I'm being unreasonable and they've only described the films they have watched themselves. I guess there is a limit too how many films you can watch and how many you can afford to buy. Nonetheless this is good package that has been smartened up and made into an ever better one.

Product Rating 92%

SIMBA THE LION KING CLIP ART

Cynostic (disk CA024)

I hate cute things, especially cute animals that have been animated in a cute way in cute films. Alright, I admit I did watch *Beauty and the Beast*... and *The Jungle Book*... and *Sleeping Beauty*. Okay, okay – I admit that I'm as big a sucker for cutesie cartoons as anyone else. Anyway if you are a fan of such things then the *Simba Clip Art Collection* will interest you.

As you might expect this is a collection of images taken from the Disney animated film *Simba the Lion King*. In fact they are actually shareware so if you do find a use for them you are asked to pay a registration fee of $22.

The pictures are of high-standard and as they are in 16 colour mode they can be used on any Amiga. They feature the fuzzy feline in a variety of poses and during several stages of development. There are pictures of Simba as a baby, as a youngster and as an adult. There are even pictures of him with young lioness, in fact there are pictures of Simba doing every kind lion-like thing imaginable – well almost.(I'll bet the're arn't any of him ripping a wilderbeast open-Ed.)

While there are several well-drawn pictures, in this two-disk set, of undeniable cuteness, its hard to see what practical use they can be put to, as you are unable to use them commercially. I guess this one is for people who have kids who enjoyed the film or just like cute lions.

Product Rating 78%

UTILITY COLL.#65

Cynostic

As the disk's title would suggest, this the 65th disk of Cynostic's collection of utilities. On the whole it's been an impressive collection so far, all the more so for its rate of growth.

● The first program that I tried out on this disk was *VirtualWorld* – who wouldn't with all the hype surrounding VR (Virtual Reality). Of course I wasn't expecting to immersed into *Lawnmower Man*-like environment, but I was interested in seeing what kind of real-time graphics the program would be capable of producing.

If you want to get a decent result from a program like this you really need at least an 020 processor and plenty of RAM. The program is already supplied with several demonstration worlds, so using the program is simply a matter of loading the world of your choice and then wandering around at your leisure. The worlds that have been supplied cover a wide range of environments, everything from cheese sandwiches to whole buildings.

There are several ways for you to navigate a world. The default mode is walk, but you can also fly, drive or even rotate around your current position. In each of these modes you use the mouse to control your movement and the "+" and "-" to control your speed. This is a very intuitive method that means you can select the most suitable mode for the type of world you are in.

The detail that the program can handle is quite impressive, especially if you are using an AGA-machine. With a 1200 or 4000 the program will take advantage of a 24-bit palette and an increased copperlist range. The program is also very fast on a 1200 but, proved to be too much for the office's 1500 to handle – as it crashed a few times.

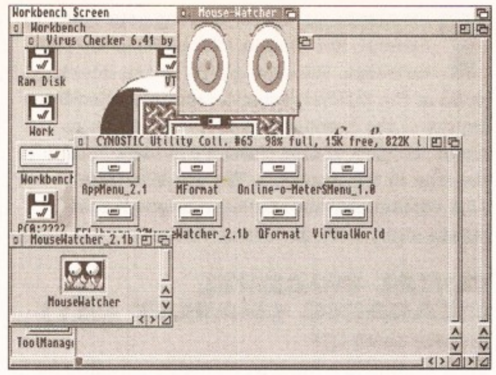
It is quite a good program and is definitely a lot of fun. Although I was a bit miffed when I couldn't find any instructions on how to create your own worlds.

● *Smenu* is a tiny program, just 25K in size, that can be used to from one screen to another. For example if you are working in Directory Opus you can easily switch back to Workbench's screen or to that of another program.

Yes . I know you can do that by pressing <left Amiga><m>. But, this simply cycles you through the available screens. *Smenu*, however will pop-up on your working screen and produce a pull-down menu with a choice available screens. This means you can go to any screen with out having to cycle through ones you don't want.

● *MouseWatcher* is a bizarre program that draws a pair of eyes on your screen that watch your mouse pointer as it moves around. I was not impressed...

● Have you seen those annoying Ronseal adverts, the ones with that bloke who always looks angry? They go a bit like this; "Ronseal damp-proofing, it does wot it says on the label – use it, or your house will turn to dust and blow away"! They really bug me! But, I will resort to similar methods to describe *QuickFormat*. It does what you think – it formats disks, use it or use another program.



Mouse-Watcher is part of Cynostic's utility collection #65 – but I no idea why.

Well, actually there is a bit more to it than that, the program can handle several different formats. Including OFS, FFS and DCFFS. It can also create bootable disks, by performing an install on the disk automatically. However, it doesn't do much else, it's not really a bad program or anything – it just doesn't do very much.

● *MFormat* is another program that performs the same function, it formats disks. But, the thing it can do that no other program can do is change the default volume name of a disk that has just been formatted – wow. Right, that's it, I've had enough of disk-formatters to last me until the end of the year.

All in all this is a pretty good collection with a couple of handy programs, most notably *VirtualWorld*.

Product Rating 85%

LUNCHTIME #5 "WARDROBE RACING FOR FOREIGNERS"

Roberta Smith DTP

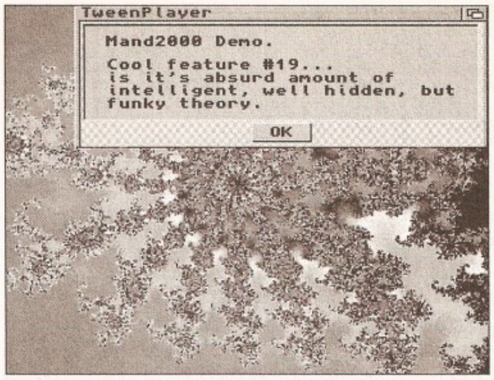
In my 8 months or so of reviewing PD software for *Amiga Shopper* I can honestly say that I have come across a number of bizarre things. But, this two-disk magazine is the most strange, but oddly entertaining thing that I have encountered.

It's produced on a yearly basis. Apparently, "the writers are all put in a little room, our eyelids are propped open with match-sticks, our mouths are sellotaped shut and our names are changed by deed poll to Dame Xanthia Sagga, until the magazine is complete". If you ask me, it all sounds a bit too much like *Amiga Format's* monthly routine.

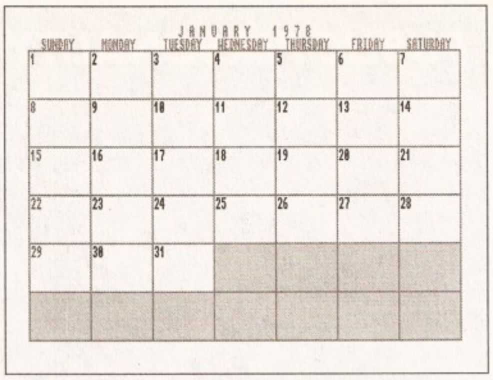
Anyway the magazine is humour-based, and I must say it is by far the funniest I've seen so far. Be warned though, it's the sort of thing that makes you laugh so much that if you're drinking at the time then it will come pouring out your nose. However, it does contain some material that is



Although Lunchtime has been certified by the British Board of Frisian Cows it may still offend.



Mand2000 is full of cool features and you don't even need a maths degree to use it.



AnyMonth is one of these spooky perpetual calanders – although it only goes up to 9999.

likely to cause offense – there's a bit of bad-language too.

On the whole though, it is hilarious. When you bootup the first thing you will see is a short animation that is a tad on the sick side, but not too much. After that has been displayed you are free to read the articles. There is a wide variety of topics covered and several short stories. One that really split my sides was the mock BNP newsletter – hilarious.

The stories are well written and vary greatly in style. Some are outrageous through out, while some start off quite seriously and then go berserk half-way through. But, they are all funny, if a little childish at times, and managed to amuse most of the office. However, you should be warned that some of them, well most really, could cause offense and are definitely the sort of thing you wouldn't like your child to read. I would advise you to buy this disk and keep it in a safe place. It may be worth something in a few years, when they have become famous – unless they are committed to an asylum first...

Product Rating 97%

MAND 2000D

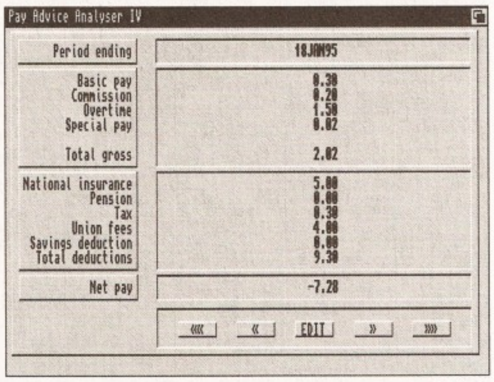
Club 1200

Whether you are into maths or not, you have to admit that fractals are pretty cool. *Mand2000*, unsurprisingly, is a program that allows you to explore the inner beauties of the Mandlebrot set. This is only a demo version of the program so one or two functions have been disabled and dialogue boxes pop-up randomly from time to time informing you of some useful function the program has.

So, you are probably wondering what *Mand2000D* has to offer that other fractal can't provide. The first thing I noticed was how intuitive to use the program is. You could quite happily go zooming about the Mandlebrot set without using any requesters, relying only on your mouse. You can also use a joystick if you wish, to move your view around.

As well as being very easy to use the program is pretty quick. Its redraw and calculation speeds are quite impressive. Its animated zoom is also very quick as well as being very handy. You can zoom in on the set by simply double clicking an area of the screen. As this is animated it stops you from being disoriented when moving from one position to another. Instead of suddenly appearing at another location the program animates the magnification.

The creation of animations is another of *Mand2000's* abilities. It can generate two kinds of animations. It can create morph anims that will morph fractal images to other shapes. It can also create zoom anims, where you enter a start and



Are you being paid for the work you've done? Find out with the Pay Advice Analyser.

end position and the program tweens the necessary frames. This one's pretty good for adding to rave demos and the like – if you are into that sort of thing of course.

The program is a perfect balance between speed and ease-of-use. It also has a number of unusually funky features and is altogether a pretty cool program.

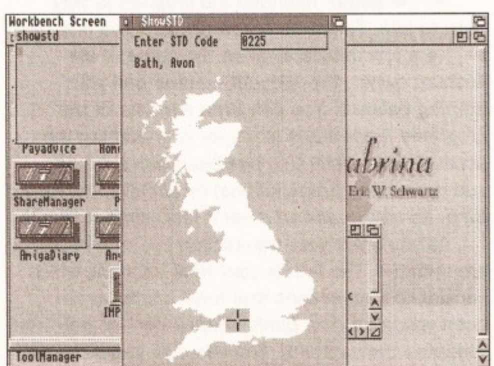
Program Rating 86%

OFFICE HELPER

Roberta Smith DTP

Office Helper is a compilation of seven programs with a common goal – to make the time you spend in your office more productive. The disk has been compiled by those nice blokes who call themselves the Assassins. The programs they have seen fit to include in this collection are: *AmigaDiary*, *AnyMonth*, *Flexer*, *Homebudget*, *Payadvice*, *ShareManager* and *ShowSTD*.

● *AnyMonth* is one of those perpetual calendar thingies – they're a bit spooky if you ask me. It's dead simple to use, you can jump to any year by entering a 4-digit number. Aha, it's not so



ShowSTD not only tell you where a postcode's town is, it will show you – not literally of course.

perpetual after all – you can't go beyond the year 9999! To change months you simply need to enter its first three letters. You can enter a short message by clicking on the day of the event.

● *AmigaDiary* is a little pop-up diary that helps you to keep track of important dates. The program also has a scribble that can be used to make brief notes.

● *Flexer* is a database program without too many frills. It pretty much follows the same format as most program of its ilk. You can define the size and positions of the fields create and give them headings. You can or sort records by any of their fields. I nice option is being able to view the records either in the form of a list or as cards.

● *HomeBudget* is a home accounts package. Again this is a program that is relatively easy to use. It works through a series of menus, which are represented by a set of buttons at the centre of the screen. As you click on a button you are taken to the next sub-menu or requester.

There are six main menu buttons for each section of the program. The checking button will take you to the area where you can enter what checks you have paid out. There is also a savings account menu that helps you keep track of how well your savings are doing. Clicking on the budget menu will give you access to your overall financial status. Auto Action is a great feature that can be used to add transactions that occur automatically each month. Miscellaneous accounts is where you keep track of independent accounts. You can use report to give you a graphical representation of your current status.

This a tidy little program that while it may a bit and little too simple for some peoples' needs it should have enough features for helping most to steer a course away from financial ruin.

● *Show STD* is a handy little program that will help you find what part of the country a STD code belongs. As well as typing the code's city at the top of the screen it will also plot the town's position on a map of Britain.

● *Pay Advice Analyser* can help you to keep track of how much you should expect to be paid. The program takes into account how much your basic pay is, commission, overtime and special pay. It will combine these figures to provide you with a gross pay figure. Next it will ask you for variety of deductions such as National Insurance, tax and pensions.

Once the program has both sets of figures it will set about calculating your net income. Once again it is a simple program, but it does its job with the minimum of fuss.

● *Share Manager* is a useful program if you have a large number of share portfolios. If you haven't then you'll no doubt find it exceedingly boring. If you fall into the first category you can use the program to keep track of several portfolios.

Well, there you have it, a collection of useful but simple programs. If you are running a small business or looking after the accounts of a club then I dare say you'll find this collection of some use.

Product Rating 80%

THE GIRLS OF ERIC

Cynostic

Eric Swartz has been one of the most consistently popular Amiga animators for as long as I can remember. He has produced some of the best and most humourous animations ever to be seen and what's more he has turned them out by the bucket-load. Eric has produced a wide variety animations



Sabrina is my idea of a perfect woman (skunk?) – she's got brains and looks. If you think you're more attractive send in a photo of yourself.

PUBLIC PERSONALITY

Ground Zero Software

Ground Zero Software is a PD library that has been around for some time, but has kept a relatively low profile. Jeremy Ford runs the library single-handed and yet has managed to keep the library full of some of the best new PD and shareware programs.

In fact there are one or programs in their catalogue that I've not seen elsewhere. I managed to catch Jeremy at a relatively quiet moments, to have a quick chat.

Why did you decide to run a PD library?

Originally, about three years ago now, I thought, like many people, that it would be good way to earn money. Then, after about nine months of losing money, the library started paying for itself and guess my efforts were rewarded. I guess when I first started greed was the motivating factor, but I'm not someone who is lazy, I did put the effort in to try and make it a success.

How many disks have you managed to collect now?

It's actually only about 3000. Although that might sound a little on the small side, it's not as most libraries that claim to have 7000 plus disks.

These libraries usually have a lot of older programs that nobody really orders anymore. I try go for quality rather than quantity. To be honest, there are a lot of naff programs out there and I rather just collect the best stuff.

Do you have any kind of speciality as a library?

I've tried to make the library different. I also try to go for one or two obscure programs, I've gotten hold of things such as a chess tournament programs, language tutors and medical programs.

Although these don't always prove popular, and it's things like *DiskSalv* and like that sell in large quantities, I think is nice to have a slightly broader choice.

What do you like best about running a PD library?

It's definitely not the long hours! I guess, because I put a lot of effort into running the library, it's nice to hear from satisfied costumers.

And the worst part?

It's got be the long hours. On an average day I start at about 9 or 10am and work until midnight.

What do you think of the Amiga PD scene at the moment?

I think that the quality of the software is improving vastly. When I look back at some older programs they were more difficult to use and less functional.

In general they are much easier to use. At the moment there is a very large number of products flooding in all the time.

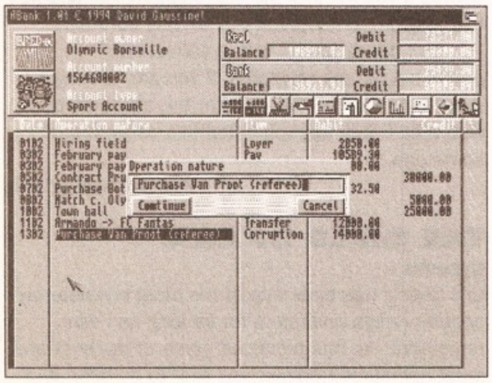
but, his most popular ones have featured a number of very female animal characters.

Apparently some people, especially reviewers, have become confused by the large number of "girls" that have made an appearance in his animations. To help clear up the confusion, and provide a little background information, Eric has decided to release a HyperBook presentation to help people differentiate between these lovely lasses.

The presentation covers five "girls", each of a different species. A text file accompanies each one that provides a brief description of their backgrounds and personalities. Amy the Squirrel, by far Eric's most popular character, is described as "51% sweetheart and 49% bitch". Apparently, "she likes to be in control of the situation, but if she loses control and becomes riled, she has the capacity to be the scariest, most elemental force you've ever dealt with".

Each "girl" has some pictures as well as a text entry. Along with Amy are Clarisse Cat, Tammy Vixen, Rachel Raccoon and my personal favourite Sabrina the Skunk. Wait, what I am saying "my personal favourite" – I'd better a get a grip and tie up this review before I lose it completely! Anyway this presentation has provided me with some interesting background information and is definitely worth a look if you're a Schwartz fan.

Product Rating 87%



ABank is attractive too, but only in terms of GUI design – Windows programmers take note.

ABANK

Immediate Arts PD

Abank is a charming little account management program from France. It was written because its Author was fed up with ugly-looking accounts programs, and who can blame him. Thankfully, *Abank* has been designed to be easy to use as well as pretty to look at. However, it is demo version of the full program and is limited to 50 operations.

Aside from being pretty, the program has a few other impressive features. It is AGIP-compatible (AMOS Global Interface Protocol), which means if you have a copy of AGIP you can alter the program's interface as much as you like. It can also load PowerPacked files. The program can simultaneously load ten accounts and can produce graphical statistics.

As the author intended the program is very easy to use. To create a new account you first need to give a few details such as the name of the account owner, the account number and your starting balance. You can even add one of the programs ready-made icons for your bank or the account type. Once this has been done you can add operations (transactions) by simply entering a date, its nature and whether it is a credit or debit.

As you enter your transaction two running titles are updated. The first is your Real balance, which consist of transactions that have and have not been validated. The Bank balance derived only from validated transactions. You can also generate bar and pie charts to give you a pictorial view of your account's status.

In operation the program pleasant and easy to use. However, it is not without one or two bugs. The main one is that it doesn't multitask probably – when you switch from the program's screen you can get back to the program. Nonetheless the memory that is taken up by the program remains unavailable – bummer.

Aside from that little quirk the program is excellent and certainly makes a change from all those dreary MS-DOS look-a-like account managers.

Program Rating 91%

THE ASSASSINS WB2 COLLECTION

Roberta Smith DTP

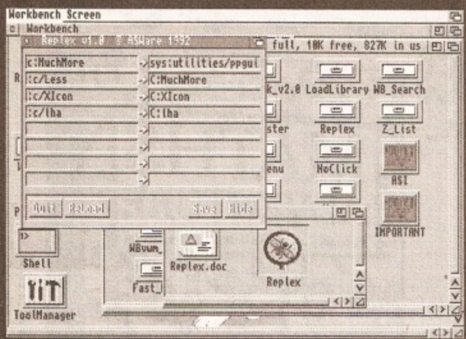
Occasionally I have a good feeling about a disk, even before inserting it into my machine's drive. This was the case with this disk, whether this was due to the way it felt in my hand or because it is part of the Assassins collection I cannot say. But, upon inserting it I was pleased to see one or two familiar programs and several that looked promising. As a result, I fell upon the contents of the disk with glee and my mouse pointer.

- The first icon that I double-clicked on was that of *PPGuide*. This is because a subscriber had requested that if a program that could display PowerPacked AmigaGuide files existed, he would very much like to see it on the subscribers' disk.

PPGuide did indeed turn out to be such a program and will also appear on this month's subscribers' disk. It is also likely to reside on my hard disk for some time.

- *LoadLibrary* is a program that just might reduce the number of times that I bash my head against my desk each issue. One drawback to doing PD World is that my Libs: directory collects a horrendous number of library files. The trouble is if you install the libs necessary to run a program you can easily forget to remove them.

LoadLibrary can be used to keep an eye on which libraries are installed to your machine. It can



Replex is a program that can fool your Amiga into thinking it's running another program.

also remove them once they have served their purpose. Using the program is easy – once it has been double-clicked it opens a small bar that once selected will bring a menu with a click of your right-mouse button. Using this menu you can load and remove libraries as necessary. Great – I love it!

● I don't believe it, I haven't bashed my head on the desk all day! *Replex* is just as helpful as *LoadLibrary* when it comes to reviewing PD programs. This little gem can be used to fool your computer into running one program instead of another when it is requested by a file.

This means you can you can use what ever program you wish to view a text file, play an animation, display a picture or whatever. This stops error messages appearing when you double-click on a file that wishes to use a viewer you do not have.

● People are strange, and some programmers are even stranger. *MTV* is a strange program, probably written by a strange programmer, for strange people. All it does is create an animated MTV logo that does all manner of unusual things in your monitors top right-hand corner. Like I said strange. Oh yes it does one other thing – it crashes my 1200 quite nicely.

● *TrashMaster* is a program that does something interesting. If you drop a file on to its icon it will delete that file. No, not like Workbench's trashcan – this program deletes files for good. Is this a good idea…?

This is a mightily impressive collection of programs and there are plenty of other familiar programs that I have not mentioned. These include Magicmenu, ToolsDaemon, NoClick and Guru. This is really a great compilation of programs that should be included in your collection.

Product Rating 95%

VIDEOTRACKER AGA

Club 1200

One of the products I enjoyed reviewing most in issue 40 was Almathera's *Video Creator*. *VideoTracker* is kinda like a PD version of *VideoCreator* as it can be used to create similar effects and sequences. In fact it could be considered to be more powerful in one sense.

VideoTracker can be used to combine animations, music modules and effects. It can even convert your own machine code effects to VideoTracker's own routine format. However, to do this successfully it will help a great deal to have the developer's kit.

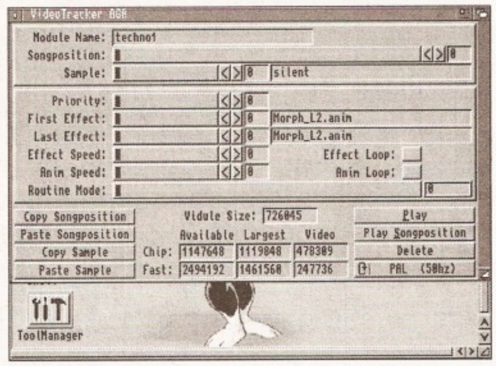
For us non-programming types the best way to describe how the program works is to compare it to a music sequencer. You can load a music module, then add animations (any anim5 format), effects etc. to create a "video". Once you are satisfied with the result, you save it as a vidule. A vidule is an executable file that will playback the routines, the module and animations.

In practice the program is very easy to use, there are even example routines and animations supplied to help get you started. If you do get into trouble you can refer to the program's comprehensive documentation. However, the documentation is too long, as a result it makes navigating it a little difficult.

The best thing about *VideoTracker* is that you can create a demo, intro or a presentation without any programming skills. All you will need is a music module, an animation program like *DPaint* and some of the routines supplied and you'll be well away. Some of the routines include things such as scrolling text and these can be used in conjunction with ASCII files and colour fonts.

The only PD competition this program has is the latest version of *MainActor* (which I'll be reviewing as soon as I find a library that stocks it), which it does not support routines as it is more of animation compiling program.

Program Rating 89%



With an Amiga and a copy of VideoTracker you'll be making Pot Noodle adverts in no time.

TOP TEN PD CHART – IT'S THE ONLY CHART THAT COUNTS

This month we continue our quest to keep you up-to-date with the most popular PD at the moment. We give you a list of the top ten programs and disks that have been ordered from two PD libraries. It gives you a chance to see which programs are popular with your fellow Amiga-users.

Club 1200

1. VideoTracker AGA
2. Blackboard
3. Magic Wb Backdrops Vol.2
4. Magic Wb Icons
5. Mand 2000D
6. A1200 Diagnostics
7. Jesus on E's Fix Disk
8. Magic Wb Backdrops Vol.1
9. Lyapunovia
10. Viewtek V1.5

57 Europa Road, Lowestoft, Suffolk, NR32 4BQ.

Roberta Smith DTP Tel: 081 455 1626

1. Vark 5 (CLI Utils)
2. Brushed Pink
3. Aircraft Clip-art
4. Please Release Me
5. Video Titler V2
6. Magic User Interface
7. Roberta's Blue Collection
8. Eagle Player
9. Office Helper
10. Cinnamon Fonts

190 Falloden Way, Hampstead Garden Suburb, London NW11 6JE

PD HOUSES PD HOUSES PD HOUSES

17 Bit Software, 1st Floor Offices, 2-8 Market Street, Wakefield, West Yorkshire, WFI IDH. Telephone (0924) 366982, Fax (0924) 200943. Catalogue .50p or free if you send an SAE. Accept phone orders, credit cards and direct debit. Open 8am–8pm Mon–Thur, 9am–5.30pm Fri–Sat.
A1200 Only PD – BJ Cowdall, 23 Barn Way, Cirencester, Gloucestershire GL7 2LY. Try to obtain all AGA PD and WB3 utils etc. Catalogue is £1.00 or send a disk and an SAE. No phone orders or credit cards. For a printed catalogue just send an SAE. Disks are £1.00 each. Frequent special offers!
Active Software, PO Box 151, Darlington, County Durham DL3 8YT. Telephone & Fax (0325) 352 260. EMail Bux8@unn.ac.uk. Specialise in professional collections, compile disk packs, essential Aminet compilations and sound samples. Catalogue is 50p. No phone orders, no credit cards or direct debit. Open 9am–9pm. Discounts to User Group members.
Activity Software, 393 Doncaster Road, Rotherham, South Yorkshire, S65 2UF. Telephone (0709) 377730. Catalogue 1st class stamp. Do not accept phone orders, credit cards or direct debit. Open from 9am - 5.30pm Mon to Sat. Additional info, also stock PC Shareware. Crazy Joe's, 141 Effingham Street, Rotherham.
AGA Exchange, 18 Brownshill, Cromer, Norwich, Norfolk, NR27 0QA. specialist areas: AGA PD/Shareware full advice service, PD exchanges, Laser printing service. Catalogue free (with s.a.e. + disk). No phone orders, credit cards or direct debit. Half price membership (£4.50) until 1/11/94.
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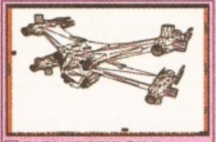
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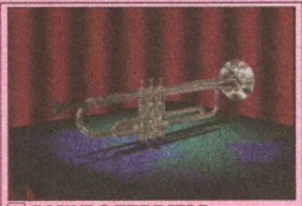
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Talking Shop

Have your say. There's £25 on offer for the best letter we publish each month. Send your opinions to: "Talking Shop", Amiga Shopper, 30 Monmouth Street, Bath, Avon BA1 2BW.

COLD COMMODORE?



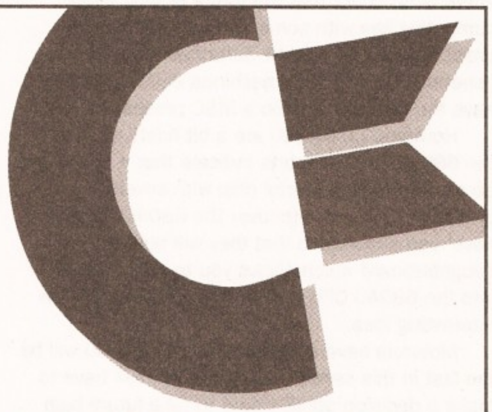
Maybe the future for the Amiga lies in Commodore's death? I mean, instead of looking for support to continue developing the Amiga technology alone, why not allow other companies to use and build upon it?

This might kill Commodore, but would mean other companies producing Amiga-compatible clones, maybe even incorporating Amiga technology into their PCs.

This would benefit the other millions who already own Amigas because new hardware and software would be continuously appearing. The Amiga has the potential to be a bigger hit than the PC, it's just establishing a similar userbase to the PC that would take a lot of effort. What we should ask is...

"Is it Commodore we wish to save or the Amiga technology itself. Are Commodore the ideal firm to try and develop the Amiga alone?"

Andy Lukaszewski
Sheffield



Would the Amiga be better off away from Commodore? See COLD COMMODORE

Although it looks as if Commodore UK are going to be the ones to carry on the Amiga line, I think there is a case for Amiga clones. Where several manufacturers are competing drives the prices down which is why PCs are now so cheap.

However, it does lead to confusion with different manufacturers taking different interpretations of the standards which exist. Look at the profusion of PC clones and the vast numbers of different types of interface buses available...

AMAZING ADVERT

After just reading the letter entitled 'DTP Dawn' last issue, which listed a lot of the excellent software available, I was hit with a brainwave. At the moment Commodore are not selling many high end machines. Why? Because not enough professional and semi-professional people know about Amigas due to lack of advertising.

Why is this? Because Commodore cannot afford to? Why can't they afford to? Because they are not selling many high end machines.

This is a vicious circle so how can it be broken? My brainwave...

Get all those nice software/hardware developers who are making all that excellent stuff to create a series of TV ads made entirely with Amigas and their products. Watch sales of machines, software and hardware soar!

Steven Balls
Kent

An extremely good and interesting idea. Programs such as *Babylon 5* have done much to raise the profile of the Amiga, but I'm sure that Commodore could do more if they put their minds to it.

Hopefully we will see some adverts of the type you describe appearing on our sets very soon.

BLASTED BASKETBALL

It is my birthday soon and I have been looking for a basketball computer game, but, you've guessed it, I'm having no luck! Please can you help me by answering a few queries?

1. Are there any basketball games on the Amiga?
2. If so how many and what are they called?
3. Can you give me a rating for all of them where one is good, five is poor, and so on.
4. Can you tell me the name of the companies which publish them?

Ian Stewart
Newcastle

No, I can't. We don't and never will, cover games, except in the particular sense of how to program and create them.

Try writing to either *Amiga Format* or *Amiga Power* at the Bath address above.

Both will be overjoyed to tell you what you want to know.

ROLLICKING REVIEWS

How is it that I can read a review in *Amiga Format* (of *Imagine 3*, for example) and be advised to buy the product as soon as possible and then read the review of the same product in *Amiga Shopper* and be told that I would be a moron to do any such thing? They are, after all, your sister magazine.

Why can't we have a bit of consistency? Who am I to believe?

Now for my guide to building The Super Amiga...

You start with an A1200. First you need to 'box' it and add five or six Zorro 3 slots (with a controller that works), five or six PC slots and four or five video slots.

The CPU should be upgraded to a 68060 or better and a fast PC-style processor added. Workbench and Kickstart could be improved and/or upgraded to allow PC Windows and DOS software to run under Workbench and Amiga DOS.

A better Agnus chip should also be added to give 6- or even 8Mb of Chip RAM which should be built in, along with 6- or 8Mb of fast RAM. A one or two GB hard drive should be built in along with a fast SCSI II smaller drive (say 100 Mb) for use with a program like 'Giga Mem' which should be built into and executed by Kickstart.

Finally, a multi-play CD-ROM drive, a FPU, a Genlock and a FMV unit should be added, with the fabled 'AAA' chipset, to turn your Amiga into a 'top of the range' video manipulation tool.

And now for something completely different...

Ever been bothered by noisy neighbours? Are you regularly kept up till gone 3am? If so, here's a way to get back at those noisy gits next door.

First you need a pair of powerful stereo speakers hooked up to your Amiga and a very cheap sample ripper. Next, load up Workbench and scan your memory with the ripper. If you haven't been using any music programs or games then the 'sample' that the ripper plays you should sound even worse than Des O'Connor.

Next save the 'sample' out to disk and wait until your neighbours have finished partying and are asleep. Then, dangle your speakers out of the window, crank the volume up to full and play back your sample continuously until dawn.

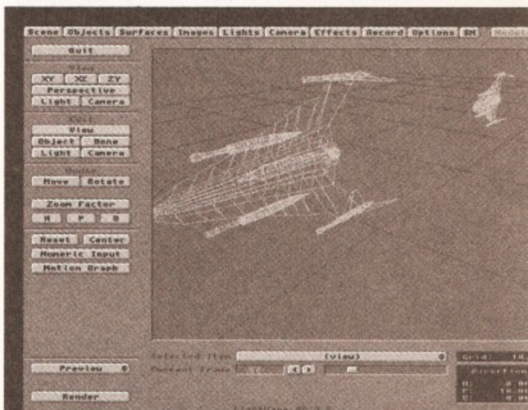
Isn't revenge sweet?

Jack Gibson
Weston-super-Mare

Although *Amiga Format* and *Amiga Shopper* are both published by Future Publishing, we are separate magazines. Part of this involves reviewing products in a different way.

We have always reviewed products from the viewpoint of the serious Amiga user and will continue to do so. If this means that we give different marks to the same product, then so be it.

As to who should you believe? Well, both reviews are done by people who know the program



Could you be seeing a program like Lightwave on your screen soon? See AMAZING ADVERT.

well and who know what they want. However, reviews can be quite personal things although both our reviews and those in *Amiga Format* give you the facts about a program.

Ultimately, the verdict is decided on the basis of how useful the program is to the person writing the review; how easy it is to use; how good the documentation is, and so on. People have different opinions, which is why for reviews of important products or programs we now ask several different people to give their opinions.

I don't think we have ever accused anybody of bring a moron for taking Amiga Format's advice. As I used to be a writer on that magazine and know the standards they expect from contributors, I think it pretty unlikely that we ever will.

Sometimes we will disagree with what *Amiga Format* says, but I think I'd rather have some interesting debate about how good programs are instead of hearing everybody saying the same thing without sufficient testing.

Your proposed new Amiga sounds like an excellent machine, but I bet it would cost a few quid. It would certainly be an incredibly powerful video workstation as long as you could afford the many thousands of pounds that it would cost.

I think that the better option is to produce a machine which can easily be expanded out to the sort of specifications you describe. After all, not everybody would need a Genlock or a PC emulator. Wouldn't you rather buy a base machine and add the bits as you need them?

This also means that you wouldn't pay extra for bits of a machine that you weren't going to use and that when you started getting into video you could add an FMV unit and a Genlock, taking your pick from the models that were available at the time.

Although the A4000 is a pretty good machine, there are problems with it (such as only having a maximum of 2Mb of Chip RAM and an extremely slow memory access). It's also way too expensive: although the Amiga is far easier to work with than PCs or Macs it is more expensive and this puts many people off.

Let's hope that the new owners of the Amiga can bring down prices of the high end machines and put some money into research and development to get the Amiga up where it belongs – at the top.

I'm not sure that playing hideous screeching noises is the best way to get back at your neighbours.

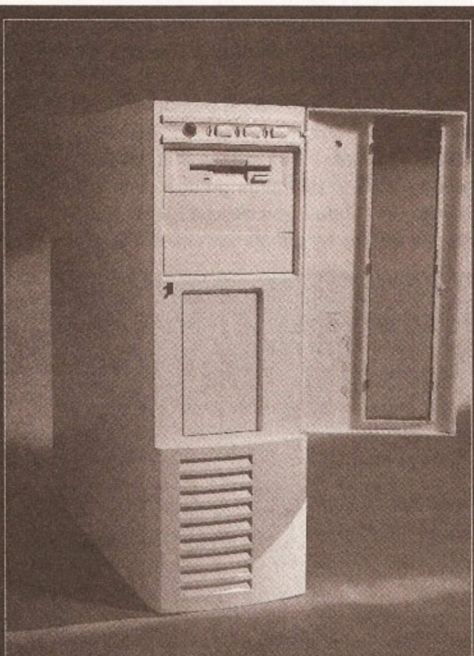
I would imagine that both the police and the Noise Abatement Society might have something to say about playing back your Amiga's memory at loud volume through the night.

I have always preferred to hold my own party and invite the entire street – everyone, that is, except my noisy neighbours.

9 out of 10 Amigas said their owners preferred...

...to read good and interesting letters in Talking Shop, the letters section of Amiga Shopper. And far be it from us to disagree with such distinguished opinions, so we offer £25 for the best letter every month. Of course, everybody has their own interests, so here's a list of the sorts of things we spend hours discussing among ourselves in the Amiga Shopper office:

The Super Amiga
Commodore UK's management buyout
Interesting and unusual uses for your Amiga
The Subscribers' disk
The next model of Amiga
What you like (or don't like) about Amiga Shopper.



Why is the A4000T so expensive? Will RISC technology supersede it? See AMAZING AMIGAS.

AMAZING AMIGAS?

It is unfortunate that the A4000T is so expensive. I am getting one in about two-and-a-half-months' from now, (I was fortunate enough to get a summer job that paid me enough) however, not many other people are so fortunate.

Something which Commodore could surely have sussed by now just by taking a quick look at the sales figures? No – obviously not, Commodore are just as arrogant as they have ever been.

Finally, here is a message to Commodore:

If I were you I would:

- **shove a 40MHz 68040 (MMU) in your A4000T along with a 50MHz FPU;**
- **add another 4Mb of fast RAM to take the total up to 10Mb;**
- **redesign the processor board so the memory chips are used on it, eliminating the memory access glitch in the A4000T's design and doubling the speed of the Amiga in the process;**
- **hack about £500 off the asking price and then try selling it.**

As for the A5000 (if it ever happens) I think the way forward is via the Power PC chip. The Power PC-based Mac can run old 680x0-based software; I think that a PowerPC-based Amiga would, too. As for Windows NT and Unix, well, the Power PC chip would make these an absolute doddle to run on an Amiga .

If Commodore decided to adopt their own processor or use the 68060 (which is likely to generate about as much heat as a small furnace!) the Amiga might not have a future.

The PowerPC range of micro processors offer unrivalled processing power, with the added benefit of parallel processing (the PowerPC 604 chip can execute no fewer than six instructions simultaneously — I'd like to see the Pentium do that!) and it looks like the ideal processor.

The simple fact is: there are now much more powerful machines on the market and unless you start making your machines more powerful, and chopping lots off the asking price (especially as you see fit not to supply any of your machines with monitors or hard disks as standard), you could find yourself going exactly the same way that Commodore US went – down the drain.

Oliver Jones
Sutton Coldfield

There is no doubt that the future of high end computing lies with some form of RISC-based processor and I would be surprised if the next generation of high end machines didn't at least have the option to run on a RISC processor.

However, I think you are a bit hasty to write off the 68060. Initial reports indicate that it is going to be an extremely powerful chip with several profound improvements over the 68040. Motorola have also announced that they will supply a daughterboard which allows you to plug a 68060 into the 68040 CPU socket which sounds like an interesting idea.

Motorola have also said that the 68060 will be the last in this series so Commodore will have to make a decision about where to take future high end machines. Some research into this was done before Commodore International went into liquidation and I imagine that designing and building the next generation of high end Amigas would be among the priorities of the new Commodore (although they will want to concentrate on getting products into the shops first).

Price is, as you say, a primary consideration. Although the A1200 and CD32 are priced just about right the A4000/030 is far too expensive and the A4000/040 is ludicrously priced. Companies such as Apple can manufacture in large quantities so bringing the price down.

Although Commodore can't match them in terms of buying power, I'm sure that there is much they can do to get down the price of the big-box Amigas.

ABSOLUTELY AREXX

I have recently discovered a pile of old *Amiga Shoppers* and stumbled across your brilliant articles on ARexx and I am trying to find the rest.

Could you please send me a list of all the back issues containing articles on ARexx from issue 21 onwards and tell me how much it would cost to purchase them.

Janos Bornemisza
Bath

Articles about ARexx were included in issues 21 to 27 and 30 to 32. See page 64 of this issue for further details on how to get hold of these back

issues. They will cost you £4 each.

FRUSTRATING FORMATS

Everyone worries about whether their investment in a particular computer model or computer format was wise. Or, as someone who uses both a Mac Power Book and a 1200 with a hard disk, that's how it seems from the many letters which appear in magazines which represent users of those particular machines. (I won't even deign to mention PCs – ugh!)

Much of this concern is misplaced, of course – you buy a machine to fulfil a purpose. If your machine does that job and if technology then moves on it seems to me you have little to complain about. So why am I complaining?

I bought an A1200 with a hard disk and a monitor. This was an upgrade from an old ST. I think the system I have (it lies perhaps in the 'mid range' of Amiga users – between a 500 and a 4000) is super.

I have a useful range of software and cheap access into video and digitising some time in the future – a prime reason for getting one if Amiga sales in the USA are anything to go by).

The problem I have lies not in the quality, range, price or availability of software but in the repeated difficulty I have had in loading or, more correctly, failing to load software on to hard disk. I will omit to include cover disk material here – I am referring to quality products like XCad - 2000 and DPaint.

I have contacted Electronic Art and had all the nonsense about the decompressed formats, and so on. There shouldn't be a non-hard disk installable version of a program of that importance. The overriding feeling I get is that Amiga suppliers either expect users to 'put up' with it (as they only use the machine for games anyway... grrr!) or alternatively that they should immerse themselves in a fairly involved learning process – editing user startup files, for example.

I'm sorry but, having used other computers where this is not necessary and only having a limited time to devote to these things, I am simply not interested in working to provide facilities which should be integral. Having read several Amiga books I am happy to save up for Directory Opus and leave it at that. I want to *use* applications not mess around unproductively with a computer operating system.

Whinging mode switching to 'off' – great magazine, keep it coming!

Peter Scott
Warminster

FURTHER FRUSTRATING FORMATS

I've got an Amiga A500 upgraded to 1Mb chip RAM and Workbench 2.1, with a GVP 80Mb hard drive with 4Mb RAM, fitted with a CSA Derringer accelerator with 68030 CPU, 68881 FPU and 4mb 32-bit RAM. And you don't. Ha!

To someone who doesn't know anything about Amiga computers, that opening sentence won't mean a thing. It is the same in the PC and Mac worlds. There are the technophiles who talk incessantly about how much better their equipment is and who moan when technology makes their equipment slightly out of date. Then there are the users, who don't care what their computer is as long as it does what they want.

Another hobby which suffers from the techno argument is photography. Some people try to keep up with the latest developments in camera technology while to others, it is the photograph which is the most important aspect.

It is very nice to have the latest and best hardware so don't complain when old software won't work. Likewise, if you have old equipment, don't moan when new software isn't compatible.

I get immense enjoyment from my hobby and believe you should be happy with what you have. The Amiga range is very reasonably priced for what it offers. It is so versatile that it is up to the individual to decide what he or she wants from his or her computer and buy accordingly.

At the end of the day the main thing is to have *fun* using it!

Russell Butler
Jersey

Both Peter Scott and Russell Butler make the same relevant point: the type of Amiga you own isn't really important, it's what you do with it that counts.

For instance, last month's cover was created by Craig Collins who only has a lowly A2000 with a measly 52Mb of disk space and look at all the excellent animations he has produced. Similarly, there are many people out there producing club newsletters and the like using only a bare minimum of equipment.

I used to be a member of a photographic club and there was always somebody showing off the latest piece of equipment, boasting about how many exposure modes it had and how the flash could recycle in under three picoseconds. While having all of these bits can be helpful they aren't worth a vegetarian sausage if you can't take photographs: having an expensive cameras won't turn you into Cartier Bresson overnight if you don't have the eye for it.

And it's the same with computers, whatever aspect you are looking at. While having the latest DTP program or the fastest accelerator on Earth may make life easier it won't be a shred of use if you don't have the ideas and the ability to turn these into images or pages.

Which is why we here at *Amiga Shopper* aim to teach you how to make the very best use of the stuff you have and why we won't blind you with technical gibberish. What we do is tell you how useful a product is, not how many gizmos it has sticking out of it.

PIRATICAL PROBLEMS?

Firstly, can I just say how pleased I am with the new editor, Richard Baguley. He only took over a couple of months ago and already there are some significant improvements (subscriptions have been sorted out, for a start). I was not going to bother renewing my subscription when it expired, but I will now.

In the August issue, there were some comments regarding Spectrum emulators and in particular the software supplied with them. Some of the publishers, especially Ocean, stated that they were opposed to people supplying copies of the Speccy games to other people for use on their Speccy emulators as this is piracy.

Well, while I suppose that technically it is piracy, can Ocean please tell me where I can buy a legitimate version of their old games to run, either on my Amiga or Speccy emulator? No? Thought not.

So, Simon Alty of Ocean before you start preaching about the evils of piracy perhaps you should consider that there is, in this case at least, absolutely no alternative – the games in question have not been on sale for a large number of years (up to ten or more in some cases)! Can I just point out that I unreservedly condemn piracy of software when such software is commercially available but, in this particular case, talk of piracy is out of place.

The SX - 1 review was also interesting (as someone who owns an A500 with WB2.1 and a CD32 connected via a fairly slow serial link at present). I am considering expanding my CD32 but there appears to be no facility with the SX - 1 for processor upgrades, and so on. Is this true? And is it true that the SX - 2 is being developed?

With regard to the WB3.1 upgrades, assuming that they are easier to obtain than WB2.1 was, (it took me many months to track that down!), are you planning a review? In particular I want to know if it is worth upgrading from WB2.1 (if you don't have 24-bit graphics) or even from WB3.0?

Keep up the good work. With the new improvements, I should imagine that AS will go from strength to strength.

Keith Blakemore-Noble
Wokingham

Whatever the situation with the availability of a program it is still a copyrighted product and thus it is an offence to copy it in any way, including with a PD emulator. However, I would be extremely surprised if Ocean would actually bother doing anything about it. When I spoke to them about this emulator they were amazed that anybody was still playing these primitive games in these days of CD32s, Frontiers and the like.

The SX-1 has no provision for processor upgrades and I'm not aware of plans for an SX-2 although I dare say that Paravision will be keeping a close eye on how well the SX-1 sells and any possible improvements they could make.

I don't think it's worth upgrading from Workbench 3 to 3.1 unless you really need one of the things that is new (such as CD-ROM support). There are even only a few improvements over Workbench 2.1, and again I really wouldn't bother unless you have a specific need for it. Well, not until the price goes down to something more reasonable, anyway.

However, if you are working with an earlier version (such as Workbench 1.3), you should upgrade immediately. If you don't, you will soon be left behind as the number of bits of software which support Workbench 1.3 is falling rapidly. AS

CONTACTING THE TALKING SHOP

To add your contribution to any of the debates going on in this page send your letters to :

Talking Shop
Amiga Shopper
30 Monmouth St
Bath
Avon BA1 2BW

Alternatively, you can E-Mail them to :

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2:2502/129.1 (FidoNet)
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All letters received at these addresses will be considered for publication unless you specifically advise us otherwise.

Your guide to safer AMIGA Shopping

Getting confused in the alluring shopping jungle is easy. Amiga Shopper leads the way to a better buy.

Colourful adverts tempt you with amazing pieces of equipment and software for your Amiga. They are faster, bigger, better and you are just dying to get your hands on them. Your first step to avoid dishonest businesses (thankfully they are a small minority, but all it takes is one!) and ultimately disappointment on your behalf, is to read our Safe Shopping advice. Follow a few simple steps and the Amiga kit of your dreams will safely be yours.

BUYING IN PERSON

● Where possible, always test any software and hardware in the shop before taking it home, to make sure that everything works properly.

● Make sure you have all the necessary leads, manuals or other accessories you should have.

● Don't forget to keep your receipt.

BUYING BY PHONE

● Be as clear as you possibly can when stating what you want to buy and make absolutely sure you confirm all the technical details. Things to bear in mind are: version numbers, memory requirements, other hardware or software required, and compatibility with your Amiga (be sure you know which version of Kickstart you have).

● Check the price you are asked to pay, and make sure that it's the same as the price advertised.

● Check that what you are ordering is actually in stock.

● Check when and how the article will be delivered, and that any extra charges are as stated on the advert.

● Note the date and name of the person you are ordering from.

BUYING BY POST

● You must remember to clearly state exactly what you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant informationabout your system set-up that will reduce the risk of hiccups.

● Make sure you keep copies of all correspondence.

MAKING RETURNS

You are entitled to return a product if it fails to meet one of the following criteria:

A The goods must be of 'merchantable quality.'

C They must be "as described".

D They must be fit for the purpose for which they were sold, or for the purpose you specified when ordering.

If they fail to satisfy any or all of the criteria, then you are entitled to:

● Return them for a refund.

● Receive compensation for part of the value.

● Get a replacement or free repair.

● When returning a product, ensure you have proof of purchase and that you return the itemas soon as possible after receiving it. That's why it is important to check it thoroughly as soon as it is delivered.

GETTING REPAIRS

● Always check the conditions of the guarantee, and servicing and replacement policy.

● Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions in the guarantee.

BUYING PD

● Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

● Shopping around is still important when buying PD because different sources charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are meant to be non-profit- making operations. AS

Buying by Mail – Ten Steps to Safety

When you're buying from any mail order company, it's worth following *Amiga Shopper's* useful guidelines to avoid confusion and disappointment:

1.) Before you send any money, ring the supplier to make sure the item you require is in stock. Ask questions about the company's policy on delivery and returns of faulty equipment. Make sure that there are no hidden costs such as postage and packaging. Find out when you can *realistically* expect to receive your goods.

2.) Always read the small print in adverts. This is normally where the unpleasant surprises are hidden

3.) Beware companies that do not include their address on their adverts. Also, avoid companies which do not answer or return your calls.

4.) By far the best method of payment is by credit card. If ordering goods of more than £100 in total value, remember that you are legally entitled to claim compensation from some credit companies if the retailer goes bust. Check your credit card company's policy carefully. You can also try to get extra insurance in advance.

5.) If you're not paying by credit card, pay by cheque. Never send cash, and avoid using postal orders.

6.) Keep records. If you are buying by credit card keep a note of the time of the order and ask for an order number. When ordering anything over the telephone, always double-check the price.

7.) When sending a cheque keep a note of the cheque number, the date and the exact value. Make sure you know the exact name of the mail order company.

8.) When you receive your goods, check them carefully. If anything is missing or faulty, contact the supplier immediately.

9.) Always order from the most recent issue of *Amiga Shopper*.

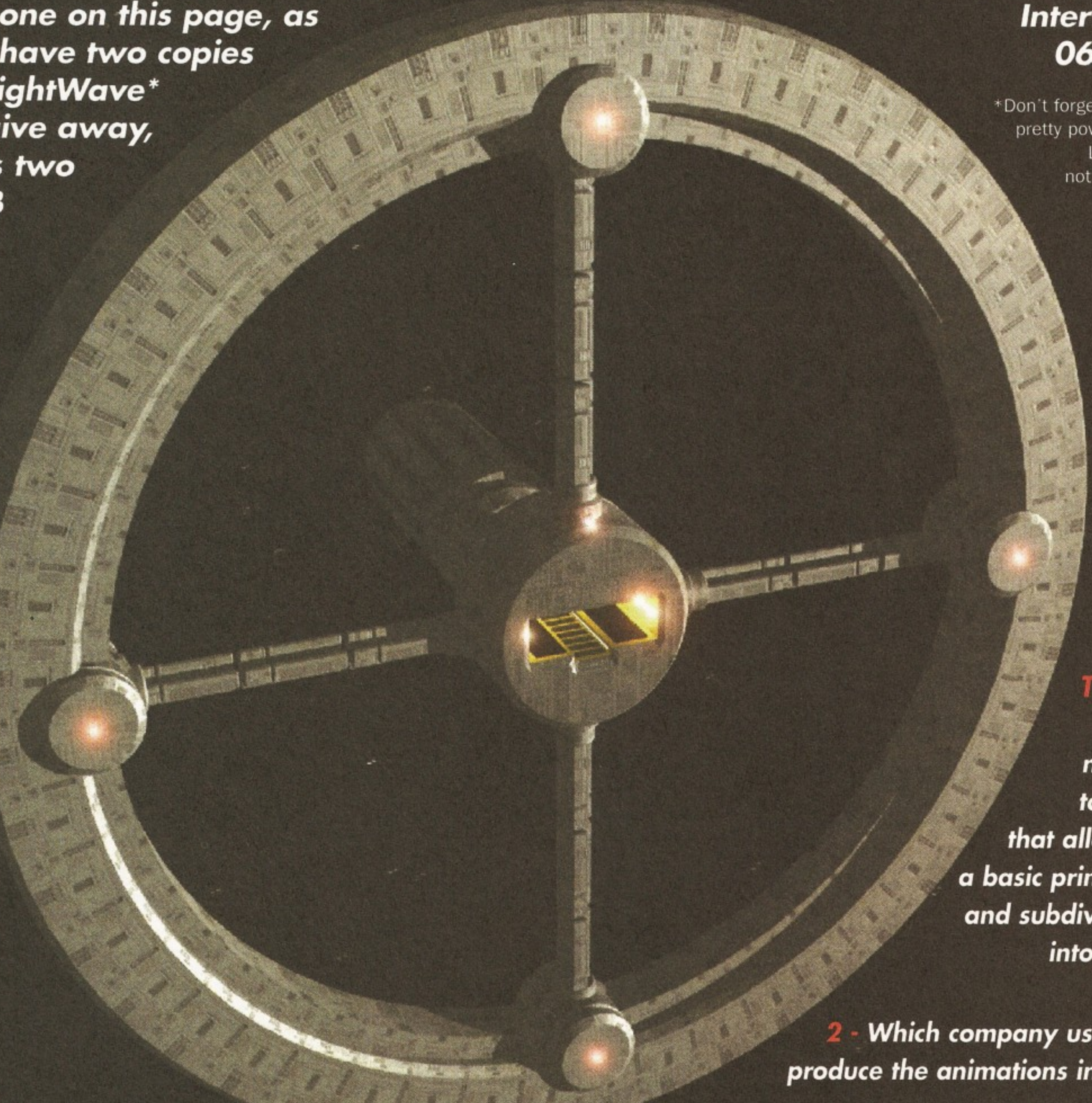
10.) If a problem does arise, contact the supplier in the first instance. Calmly and politely tell them your problem. Most problems turn out to be minor hitches or misunderstandings that can easily be resolved. If you think you have a genuine grievance, contact your local Trading Standards Officer. The number is in the phone book.

ADVERTISERS INDEX

Catch the crest of a Wave

This month, we got together with those nice people at Ramiga International (one of the Commodore Amiga Centres of Excellence) to offer you a stonking prize. You too could be producing images like the one on this page, as we have two copies of LightWave* to give away, plus two DKB Megachip Chip RAM upgrades. We also have a special bonus prize of five copies of the LightWave Collection from the 24 Bit Club. If you want further details of any of these products, call Ramiga International on 0690 770304

*Don't forget that you will need a pretty powerful machine to run LightWave, and this is not included in the prize.



THE QUESTIONS

1 - What is the name of the new tool in LightWave that allows you to take a basic primitive-like shape and subdivide and sculpt it into a new, smooth-looking object?

2 - Which company used LightWave to produce the animations in seaQuest DSV?

3 - What CPU is the Raptor Plus based on?

All of the answers to these questions are in this issue, so get reading!

To win, simply send your answers to the above questions on the back of a postcard to:

Let there be light
Amiga Shopper
30 Monmouth St
Bath
Avon BA1 2BT

Alternatively, you can E-Mail your entries to:
LightWave@amshop.demon.co.uk

Please also specify whether you would prefer a DKB Megachip or a copy of the LightWave collection as your other prize.

SEEING IS BELIEVING

Congratulations are due to Mrs Carol Pritchard of Hockley in Essex, who is the winner of our competition to win a Retina ZIII Graphics card. Your prize will be on the way shortly!

PageStream 3



Has Amiga DTP come of age?

It's taken a long time coming, but the latest and (possibly) greatest Amiga DTP program is finally here. Next month we will take it apart, and ask DTP professionals what they think of it. Plus all the usual reviews, tutorials and other bits.

On sale Tuesday 1st November. £2.50

BE SURE TO AVOID DISAPPOINTMENT – RESERVE YOUR FAVOURITE MAGAZINE AT YOUR LOCAL NEWSAGENT NOW!

• *PS Oh, and if you do have any problems getting hold of your favourite Amiga mag, call Kate Elston on 0225 442244 and she'll help you out.*

DEAR NEWSAGENT, Please reserve/deliver me a copy of *Amiga Shopper* every month, beginning with the December issue, going on sale on Tuesday 1 Nov.

Name ______________________

Address ______________________

____

____

Postcode _____________ ☎ ___________

• NOTE TO NEWSAGENT: *Amiga Shopper* is published by Future Publishing (0225 442244) and is available from your local wholesaler.

AT-A-GLANCE GUIDE

To help you find what you want quickly, here is a cross-referenced list of everything covered in this month's *Amiga Shopper*. You'll find a detailed index to the problem-solving Amiga Answers section on page 46. The page numbers given are for the first page of the article in which the subject is mentioned.

Are there any products or subjects you'd like us to take a look at? Well, just drop a line to: *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW.

AMIGA SHOPPER

Issue 43 – November 1994

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Member of the Audit Bureau of Circulations
ABC Audited circulation January – June 1994: 31,602
Annual subscription rate £30 (UK), £40 (EC), £57 (Rest of World)
Printed by Southernprint Ltd, Poole, Dorset
ISSN 0961-7302 Printed in the UK
Circulation Manager: Jon Bickley
News Trade Distribution – UK and Worldwide: Future Publishing 0225 442244

Editorial and Advertising: 30 Monmouth Street, Bath, Avon BA1 2BW
☎ 0225 442244 Fax: 0225 446019
E-mail: amshopper@cix.compulink.co.uk

Subscriptions: Future Publishing Ltd, FREEPOST(BS4900) Somerton, Somerset TA11 6BR. ☎ 0225 822510

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QUALITY PERIPHERALS FOR THE AMIGA

AMITEK

FRIENDLY TECHNOLOGY

Designed to bring you high quality and performance at affordable prices, Amitek peripherals offer outstanding value-for-money. They are built to ensure easy fitting and trouble free operation - making them a pleasure to use. Amitek products are also thoroughly tested and very reliable, so reliable that we are pleased to offer a full two year warranty on the Amitek products detailed here.

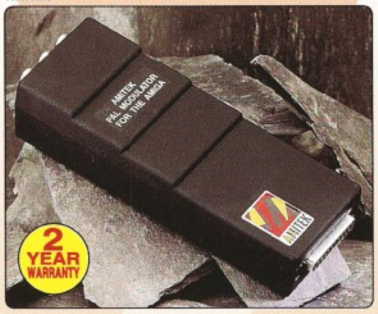
RAM UPGRADES

FOR A500/A500PLUS/A600 - 2YR WARRANTY

CODE	DESCRIPTION	INC VAT
RAM 0505	A500 - 512K (No Clock)	£20
RAM 0510	A500 - 512K (With Clock)	£25
RAM 0520	A500PLUS - 1Mb RAM	£30
RAM 0605	A600 - 1Mb (No Clock)	£30
RAM 0610	A600 - 1Mb (With Clock)	£40

MODULATOR

FOR ALL AMIGAS



The Amitek External Modulator makes an ideal replacement modulator for all Amiga owners. Everything needed is supplied. Like all Amitek peripherals, it comes with an easy to follow manual.

- User friendly manual included
- High quality design
- FREE RF cable supplied

MODULATOR £34 INC VAT - MOA 4200

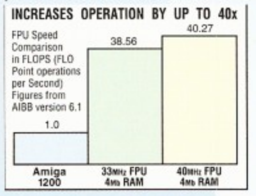
HAWK RAM UPGRADE & MATHS ACCELERATOR

FOR THE AMIGA 1200



Maximise the processing power of your standard A1200. Be ready for the new generation of software which makes more demands on Amiga memory and technology. The Amitek Hawk RAM expansion includes up to 8Mb fast 32-bit RAM, the ability to support a sophisticated 68882 FPU (Floating Point Unit - drastically increases the speed of maths intensive operations) and a battery backed up clock. Built to a high standard, this board can be easily installed and comes with a 2 year warranty. The Hawk RAM board is available in 9 pre-configured versions enabling you to select the model which best suits your requirements.

INCREASES OPERATION BY UP TO 40x



- Plugs straight into A1200 trapdoor - No soldering required
- Upgradeable FAST RAM board to 1, 2, 4 or 8Mb
- Uses industry standard socketed SIMMs for easy upgrades
- Two types of optional Floating Point Unit - 33MHz or 40MHz PLCC 68882 co-processor
- Comprehensive manual with illustrations
- Works with all A1200 and A1200HD computers
- Does not invalidate your A1200 warranty
- 2 year warranty

	NO FPU	33 MHz FPU	40 MHz FPU
1 Mb RAM	£99 INC VAT - RAM 1210	£159 INC VAT - RAM 1213	-
2 Mb RAM	£139 INC VAT - RAM 1220	£199 INC VAT - RAM 1223	-
4 Mb RAM	£199 INC VAT - RAM 1240	£259 INC VAT - RAM 1243	£299 INC VAT - RAM 1244
8 Mb RAM	£399 INC VAT - RAM 1280	-	£499 INC VAT - RAM 1284

PRICES FROM ONLY

1Mb RAM, NO FPU £99 INC VAT - RAM 1210

1Mb SONY® 3½" DELUXE FLOPPY DRIVE

FOR ALL AMIGA COMPUTERS



'Amitek's new disk drive combines an elegant design, high build quality and smooth performance in a very affordable package. Highly recommended'. Jason Holborn - Leading Amiga Journalist

DELUXE FEATURES

The Amitek drive has many deluxe features not included in other drives - check out the competition!

ANTI-CLICK

This feature stops your drive making whirs and clicks when the drive is empty and searching for a disk.

ANTI-VIRUS

This switchable mode stops track 0 viruses infecting the disk while in the drive. Unlike many other drives which have virus killers, this mode can be disabled, allowing some fussy copy protected software to run.

ADD MORE DRIVES

The Amitek drive is also daisy-chainable, so you can add further drives to your system, using very little power from your Amiga.

QUALITY SONY MECHANISM

Amitek took the time to source a mechanism that has all the features, quality and reliability that Amiga owners demand.

Details taken from models available MARCH '94	ANTI-CLICK	ANTI-VIRUS	ROBUST STEEL CASE	QUALITY SONY MECHANISM	TOP RATED CU-AMIGA MAY '94 90%	2 YEAR WARRANTY
AMITEK	✓	✓	✓	✓	✓	✓
CUMANA	–	–	–	–	–	–
ZAPPO	–	–	✓	–	–	–

- High Quality 3½" Sony Mechanism
- Strong Metal Casing
- Built-In Anti-Click Feature
- Switchable Anti-Virus Mode
- Enable/Disable Switch
- 75ms Access Time
- Daisy Chainable Via Thru Port
- Low Power Usage
- External PSU Not Req'd
- 2 Year Warranty

EXTERNAL DRIVE £59 INC VAT. - DRI 1159

1Mb INTERNAL FLOPPY DRIVES

FOR AMIGA 500/500PLUS & AMIGA 600/1200

These internal Amitek replacement drives are ideal for users who wish to replace their existing internal drive.



The packs feature a high quality internal 1Mb 3½" drive mechanism for the Amiga 500/500PLUS or Amiga 600/1200. All you need to fit your drive is included, plus easy to follow fitting instructions and 24 months warranty.

2 YEAR WARRANTY

A500/A500PLUS INTERNAL DRIVE £34 INC VAT - DRI 3600

A600/A1200 INTERNAL DRIVE £44 INC VAT - DRI 3605

PROFESSIONAL GENLOCK

FOR ALL AMIGA COMPUTERS

NEW!



- Input and Output Composite Video Signals
- Switch between, Video ONLY, Computer ONLY and Mixed Outputs
- Hardware Fade to fade away the level of Overlay/Video
- RGB Thru - Not Genlocked

2 YEAR WARRANTY

GENLOCK £99 INC VAT - VID 2199

THE SILICA SERVICE

SILICA 1978 1994 16 YEARS SERVICE TO YOU

Before you decide when to buy your new Amiga products, we suggest you think very carefully about WHERE you buy them. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals or software, or help and advice. And, will the company you buy from contact you with details of new products? At Silica, we ensure that you will have nothing to worry about. With our unrivalled experience and expertise, we can meet our customers' requirements with an understanding which is second to none. Complete and return the coupon now for our latest FREE literature and begin to experience the "Silica Service".

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To: Silica, AMSHP-1194-213, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND ME AN AMIGA CATALOGUE

Mr/Mrs/Miss/Ms: .... Initials: ....

Surname: ....

Company (if applicable): ....

Address: ....

.... Postcode: ....

Tel (Home): ....

Tel (Work): ....

Which computer(s), if any, do you own?

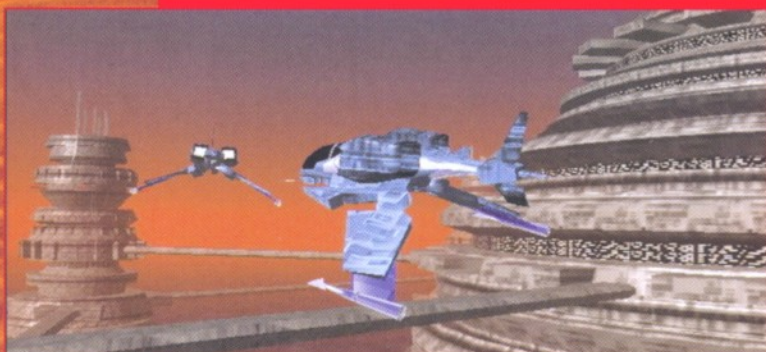
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E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.

Can ProText 6.5 keep up with the Final Writers of this world? See page 24.

Pixel Pro Version 2 promises to make 3D objects easier to fiddle with. See page 25.

The Raptor Plus promises a quite astonishingly large speed increase for LightWave, but is it worth £14,500? We investigate by getting intimate with the first captive Raptor in Europe on page 32.



Are you lost in a maze of Amiga problems? Let our panel of experts show you how to get out – only in Amiga Answers. See page 46.



Our experts show you what this Amiga business is all about in our 17 pages of tutorials on subjects such as AmigaDOS, Comms, AMOS, C programming and Assembly language programming.